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The guide, intended as a model for teachers who will develop their own arithmetic curricular materials, introduces concepts sequentially from simple to complex and continues them from one level to the next at increasingly more difficult and abstract levels. The program is arbitrarily cut into four levels to correspond to school divisions: primary (ages 6 to 9), intermediate (ages 9 to 12), junior high (ages 12 to 14), and senior high (ages 14 to adulthood) which is oriented to job requirements and money management. It presents concepts or skills to be developed, suggests teaching methods and aids, and indicates practical ways for students to use these concepts and skills. Three sample units present 10 to 14 lessons on the personal approach to numbers (primary level), time (intermediate level), and checking account procedures (senior high level). (LE)

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SPECIAL EDUCATION CURRICULUM DEVELOPMENT CENTER
an in-service training approach . . .

PLANNING AN ARITHMETIC CURRICULUM

FOR THE EDUCABLE MENTALLY RETARDED

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A Cooperative Program Involving
The Iowa State Department Of Public Instruction
And The University Of Iowa

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SPECIAL EDUCATION CURRICULUM DEVELOPMENT CENTER

An In-service Training Program

PLANNING AN ARITHMETIC CURRICULUM FOR THE EDUCABLE MENTALLY RETARDED

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POLICY STATEMENT

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The Special Education Curriculum Development Center has as its main objective the operation of a statewide in-service training program for teachers of the mentally retarded. Twenty special class teachers from different areas of Iowa serve as consulting teachers. They attend training sessions at the University of Iowa and then return to their home area to conduct field sessions. All materials prepared for SECDC are intended for dissemination through the field sessions conducted by the consulting teachers. Persons reading SECDC material but not attending the field sessions should keep in mind that the purpose of the material is to serve as a starting point for in-service training and that the publications themselves are not end products.

It should also be noted that any reference to commercially prepared materials by the Special Education Curriculum Development Center does not constitute a recommendation or endorsement for purchase. The consideration of such material is intended solely as a means of assisting teachers and administrators in the evaluation of materials.

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INTRODUCTION

The educable mentally retarded need basic arithmetic; it is an essential part of their total curriculum. Few educators would question that.

Numbers pervade daily adult life, often insidiously, so that people are unaware of their dependency. Arithmetic concepts are involved in quoting addresses, complaining about a weight gain, balancing checking accounts, even in angrily berating a wife for being late again.

Because the retarded individual lives so closely with numerical concepts, he must have a basic knowledge of their use and application. He is then better able to maintain some sense of independence.

While the need for basic guidelines in teaching arithmetic concepts and skills to the mentally retarded is apparent, the means for fulfilling the need are not so apparent. There are numerous texts, workbooks, and bulletins published which attempt to provide for the mathematical needs of the retarded. Few, however, come close to providing a sequential, continuous program that is relevant to the needs of the retarded from childhood through adulthood.

Many of the SECDC publications in the past have been prepared in response to teacher-expressed needs. The present publication also focusses on a subject area in which teachers have indicated that they desire assistance. In analyzing various arithmetic curriculums and texts, it was found that skills were often not sequenced and, more often, lacked continuity through the total curriculum. Tremendous differences were also noted in the kinds of skills that were to be taught from level to level. Some programs were highly academic, relying on either reduced difficulty or longer periods of time to differentiate their special programs from regular mathematics programs. Other programs attempted to take a more practical approach by directing their thrust toward life experiences. Typically, these programs failed to develop the basic readiness and number skills needed to assure competent handling of practical life situations (i.e., consumer buying, checking procedures, etc.).

SECDC's goal, then, has been to alleviate the confusion and inconsistency that has characterized the typical approach to arithmetic for the retarded. The SECDC staff has not attempted to prepare a complete curriculum, but rather to offer a basic heuristic model upon which the teacher may expand, transform, and develop his own arithmetic curricular materials specific to the needs, abilities and level of his class. Many arithmetic curriculum guides, texts, workbooks, and other published materials expressly aimed at the retarded have been scrutinized. From these materials, the staff has chosen those concepts, understandings, and skills that appear to stand at the center of the needs and abilities of the retarded. These concepts, understandings, and skills were then arranged into a sequential and continuous order according to a basic model. It should be added that a good deal of research went into formulating both the model and associated content.

This publication was designed to serve as the base upon which local school departments may develop an adequate arithmetic program for all retarded individuals from the primary level through the end of high school. Consequently, the model has been arbitrarily divided into four categories which parallel the divisions currently in use by many school districts.

The first category is devoted to the primary group ranging in chronological age from six to nine years. The second category is devoted to the intermediate group comprising ages nine through twelve.

The junior high division includes ages twelve through fourteen. The senior high group deals with ages fourteen and up through adulthood, although public school attendance is usually terminated by age twenty-one.

The model is organized into outline form for easy reference by the teacher. The format includes three columns;

Arithmetic Concept	Concept Development	Concept Application
Specifies the concept to be taught, along with an indication of the level of complexity.	Suggests methods and aids by which the teacher may impart the concept.	Indicates some ways the concept may be practically applied by the student.

The concepts are introduced in a sequential fashion from the simple to the complex, and are continued from one level to the next. For example, the readiness concept of spatial awareness is placed first at the primary level. At this point one should be concerned only with developing general notions of space, i.e., up and down, in and out, under and over, etc. However, the concept is not dropped at this stage. Provisions are made for the use and expansion of this concept through the total program at increasingly more difficult and abstract levels. It is felt that the approach to program development will eliminate the situation in which the child has failed to grasp skills upon which further progress depends.

In summary, the model attempts to place arithmetic concepts and skills in logical order, and to provide for their thorough development from elementary levels through advanced levels. This is not a total curriculum; rather it is an outline for the teacher to use in building his own program. The first column of the model presents the concept or skill to be developed, the second column provides suggestions for teaching the concept, while the third column gives examples of applications intended to strengthen and provide greater meaning to the concept. The attempt has been made to suggest activities that will involve the students in concrete, meaningful educational experiences.

Unit Teaching in Arithmetic

Life Experience Units offer an avenue for teaching arithmetic skills and concepts to the educable mentally retarded. Three starter units are included to illustrate teaching techniques. As has been true of other starter units prepared by SECDC, these include the complete preliminary steps and ten to fourteen representative lessons. Again the purpose of these units are to provide a basis upon which the individual teacher may develop his own units.

These starter units represent three levels -- the primary, intermediate and advanced -- as well as three separate content areas: (1) The personal approach to numbers, (2) Time, and (3) Checking account procedures. Each unit has a major thrust, but nevertheless provides ample opportunity for introducing and strengthening secondary concepts and skills in a meaningful context. For example, the unit on Checking Accounts at the advanced level provides a rather specific approach to that problem. Nevertheless, secondary concepts of time, numbers and money are crucial to the development of the unit topic. These secondary concepts are strengthened, developed and polished in a way impossible through the isolated use of worksheets and drill. It is felt, then, that unit teaching provides a highly effective vehicle by which the arithmetic program may be implemented.

SUGGESTED CURRICULUM CONTENT

PRIMARY LEVEL

CURRICULUM CONTENT-PRIMARY

Number Readiness Concept	Concept Development	Concept Application
1. Develop spatial awareness.	Discuss and demonstrate the meanings of the following: 1. Up and down 2. In and out 3. Before, behind, and beside 4. Above and below 5. Near and far 6. Here and there 7. On and under 8. Front and back 9. Under and over	Pupils can go through demonstrative or illustrative exercises and games to experience the concept. One game might be "In and Out the Window," and another "Jack be Nimble." Also use everyday experiences in the classroom, such as "Come to the front of the Room" or "Sit beside Johnny," etc.
2. Introduce the quantity concept.	Discuss and involve the students in: 1. Many and few 2. Much and little 3. More and less 4. Handful 5. Cupful 6. Empty and full	Have individuals demonstrate these concepts with blocks, toys, etc.
3. Develop the concept of cardinal numbers: one to ten.	Involve the class orally in: 1. Counting in chorus the numbers from 1 to 10 in games and rhymes. 2. Counting meaningful objects (blocks, people, chairs, pieces of candy). 3. Finger games that involve counting.	Counting and recognizing sets of objects i.e., three dogs, two cats, four boys. Isolating objects by numbers, i.e., "Where are the three boys?" Counting and stacking coins of different denominations. Rearranging objects on a flannel board into sets and indicating orally the number represented.

Number Readiness Concept	Concept Development	Concept Application
4. Introduce the use of ordinal numbers: first to tenth.	Through finger games indicate which is the first finger, second finger, etc. Demonstrate and involve pupils in the use of ordinal numbers as an expression of order for persons, e.g., "Mary will be first in line today." Involve the class in the use of ordinal numbers through situations where an order of action is required, e.g., "John will be the first to tell his story."	Rearrange scrambled numberical sequences into an ordinal expression. Introduce into classroom discussion situations where ordinal numbers would be logical answers, e.g., "Which is your place in line, Ellen?" "I am second," she replies.
5. Develop concepts of form discrimination.	Prepare for number symbols by introducing geometric shapes. This will stimulate form discrimination and help prevent reversals and rotations. Use the square, circle, triangle, star, and components of these shapes.	Using games and exercises have the child reproduce, match, and discriminate between these forms. Use templates and tracing forms to guide the child toward proper proportions and train him in the sequence of strokes necessary to develop the shapes.
6. Introduce concepts of time difference.	Using pictures and drawings from the pupil's experiences, discuss: 1. Morning 2. Noon 3. Afternoon 4. Evening 5. Night 6. Day 7. Midnight 8. Soon 9. Later 10. Right now 11. Now 12. AM and PM 13. Summer and winter 14. Fast and slow 15. Early and late 16. First and last 17. Fastest and slowest	Determine relationship to gross time units by discussing usual activities related to certain times of day. Have the child demonstrate an awareness of the meanings of relative associations: soon, later, now, etc. The child should demonstrate knowledge of days of the week and activities that are appropriate for these days. Relate this to the school schedule so he knows that certain activities are carried out on a certain morning or afternoon, etc.

Number Readiness Concept	Concept Development	Concept Application
7. Develop awareness of size differences in bulk and linear forms.	Discuss the meanings of the concepts: 1. Big and little 2. Large and small 3. Short and long or tall 4. Thin and fat or stout	With pictures and concrete objects, have pupils illustrate the meanings of these concepts.
8. Develop an awareness of size relationships with reference to weights.	Discuss differences of: 1. Heavy and light 2. Large and small	Determine which of a variety of articles are heavy, light, large or small; feathers, blocks of wood, books, empty boxes, bricks, etc., may be used.
9. Introduce concepts of temperature difference.	Illustrate and demonstrate differences of: 1. Hot and cold 2. Warm 3. Boiling and freezing	Have the pupils demonstrate temperature differences to the class with ice cubes, heating pads, warm and cold water.

Arithmetic Concept	Concept Development	Concept Application
1. Use of numbers.	Expand and develop the concept by showing many uses of numbers: 1. Counting to determine quantity 2. Numbers to determine position or order 3. Relative numbers in measurement a. linear b. weight c. temperature (1) weather (2) body 4. Money 5. Numbers used as identification	Pupils should be encouraged to participate in compiling a scrapbook of pictures showing the uses of numbers.
2. Continue number awareness and rote counting of cardinal numbers one to ten. Include ordinal numbers as a parallel concept.	Involve the pupils in a variety of activities which will increase their awareness of numbers and number symbols. (Arabic). 1. Rhythm games 2. Rhymes 3. Using body parts as an aid in counting: i.e., one nose, two eyes, etc. 4. Counting objects in realistic situations: a. attendance b. lunch count c. milk count d. simple coin counting (1) banking (2) change counting e. object counting 5. Learning to read, say, and write numbers that relate to the individual	Application, in this case, is combined with development. In playing the games, chanting the rhymes, and performing the administrative lunch and milk counts, the child will be developing his number concept. The numbers listed in #5 are functional and relate directly to an individual's activities within his family, his community and his school. Each child should frequently be called on to demonstrate his mastery of these numbers, to discriminate among them, and to determine which is appropriate in any given situation.

Arithmetic Concept	Concept Development	Concept Application
	(Arabic): a. home phone number b. home address and zip code c. school room number d. birthdate and age e. number of brothers and sisters f. bus number or route number g. locker number h. TV channel numbers	
3. Introduce cardinal numbers in symbol form (Arabic).	Using various aids, develop recognition of and the ability to produce numerical symbols. Examples could include: 1. Flash cards 2. Blocks (number) 3. Tracing aids	A form of Bingo where the child places a tag or chip over numbers as they are called is useful. A similar game could be dittoed showing the numbers as dots. As the numbers are called, each child would be required to determine whether his card contained that number, and if it did, to trace over the dots to form the number symbol. The first "four in a row" would win and he would be "it" - entitled to call out the next numbers from a random list. These games should involve only numbers from one to ten at this level.
4. Numbers as a means of identification.	The child needs to be aware that his home telephone number is unique-that no one else has this number. The same is true of his address. Students should know their birthdate: month, day and year. The child should know the classroom	Each pupil should rote learn his phone number, home address, and birthdate. This is a matter of safety and proper identification. If the child reaches the stage where he can write his name, he should be encouraged to include the date and room number on paper work.

Arithmetic Concept	Concept Development	Concept Application
	number, if only to practice using numbers.	
5. Numbers as an expression of order.	Develop the concept of numerical order by using the calendar, clock, pages in books, and grade placement.	Use number games, puzzles, and songs which use a numerical sequence. Examples are: (1) Two Little Indians (2) Button My Shoe (3) Arranging number cards in sequence.
6. Introduce money as a numerical concept.	Discuss barter as a means of exchanging goods. This should be kept at the level of exchanging marbles, baseball cards, etc., not in the more sophisticated sense. Introduce the denominations of coins and currency. (a) penny (b) nickel (c) dime (d) quarter (e) half dollar (f) one dollar bill Demonstrate and have pupils use the cent (¢) sign when writing monetary amounts.	Practice counting change in low denominations (1¢, 5¢, 10¢). Involve small totals, not over 10¢. Use real money. Use a "store" situation where one pupil can perform as "store keeper" and sell penny candies or other items not exceeding 10¢ in value. Use real money and encourage change making. Take a field trip to a store and let each pupil purchase something valued from one to ten cents. Allow them to practice reading the prices of items and evaluate their relative value. This can be the germ planted for later evaluations made on comparison shopping and critical buying field trips.
7. Introduce concepts of time and time difference.	Continue emphasis on time-related words: soon, later, now, etc. Discuss the concept of a year as a large block of time which is designated, or	Use and encourage pupils to use time-related words in activities and discussions. Make them aware of their use of these words.

Arithmetic Concept	Concept Development	Concept Application
	labeled, by a number and represented by this number on the calendar. Involve pupils in a discussion of the idea that a year can be divided in half. This is not yet the time for relating six months to half a year. New Year's Day can be explained as the start or beginning of a new year and a part of Christmas vacation. Discuss divisions of the year in relation to seasons. Make these more meaningful by involving the pupils with seasonal activities of interest. Relate time to the concept of monthly units. Do not be concerned with relating months to years except in a superficial way, or if students ask questions which logically lead to this. In developing the week as a unit of time, days are logically included. The week can be broken into two parts, school days and week-ends. The time unit of a day should be related the week, and as abilities dictate, to the month, especially in conjunction with the calendar. A primary involvement with the day as a time unit should be the basic divisions:	Have each child learn his birth year and the current year. Discuss becoming a year older on a certain date--the birthday. Consider, with the class, each child's birthday and roughly calculate how far away each is: almost a year away is much less than a year away, for example. Pupils can apply this divisional concept through a "seasonal art show" of cut-out pictures and drawings showing their favorite seasonal activities. Each pupil could relate, by tape recorder, his favorite season and why he likes it. These could be played back to the entire class or as a parent entertainment program. Have pupils make calendars for the current month and mark days of special significance. Use months and seasons in discussions about special events such as birthdays, Christmas, Halloween, Thanksgiving, etc. This should help with personal identification. Field trips to places where one season or another makes it especially interesting as a

Arithmetic Concept	Concept Development	Concept Application
	a. night and day b. a.m. or morning c. p.m. or afternoon d. evening The day should be expanded into a time unit made up of 24 hours. Many children are misled by the 12-hour clock face and believe that a day has only 12 hours. The period of time from the supper or dinner hour to bedtime is usually designated as evening. This is an important time for the child. It is when he "tapers off" from the day's activities and indulges in the fantasy of TV. He should think of it as that part of the day when we get the final nourishment, relax with family members in shared games, movies, or TV; prepare for and go to bed. The 12 hour clock commonly used in this country reflects our morning, noon, and afternoon concepts. It should be used in establishing these concepts. Using a clock face, pupils should be instructed in reading time to full and half hours.	recreational attraction or beauty spot. This could be reinforced by movies of places the class has visited (they are pleased to see films of a spot they know or have visited) and those areas that may be too remote. Have each child dramatize his life during a typical day. He could involve other pupils in his act. Each school day, as part of opening exercises, the class should name the day (Monday, Tuesday, etc.), the numerical position of the day in the month, and mark this off the calendar. This may be reinforced by writing the information on the blackboard. Activity schedules for mornings and afternoons at school or at home could be compiled. Pupils may indicate their daily schedules as before, but put them into an hourly framework. The evening concept may be reinforced by schedules of TV programs. Commercial aids, old watches or clocks that can be easily set, or classroom projects of paper

Arithmetic Concept	Concept Development	Concept Application
		plates and cardboard hands are essential for indicating: (a) dinner time (b) play or TV time (1) special shows at different hours and/or on different days (2) shared games of other special evening activities (c) bath and bedtime
8. Introduce concepts of relationship in linear measurements.	Introduce the foot as a unit of measurement. Measure a variety of objects which normally use the foot as the basic unit of measure. Introduce a foot rule divided into half-foot segments. These rulers can be made of thin unmarked strips of wood cut to foot lengths, oak tag, or heavy cardboard. The children can progressively graduate these, starting with the half-foot division and going on to whole inches as it becomes appropriate.	Measure each class member and determine height to the nearest foot using an ungraduated foot rule. Measure the classroom, playground and other large objects to determine dimensions in feet. Measure specified items to the nearest ½ foot.
9. Introduce the inch as a unit of measurement and part of a foot.	Class members can take ungraduated foot rules and divide or graduate them into inch divisions. Pupils should practice measuring lines, blocks, and selected objects to become familiar with inch-expressed measurements.	Use a foot rule graduated in inches to measure appropriate objects, e.g, books, bricks, boxes, room size, their own hands, feet, and arms. Pupils should be assigned measurement projects which will utilize foot and inch combinations.

Arithmetic Concept	Concept Development	Concept Application
10. Introduce the mile as a greater unit of measurement.	The mile should be considered alone and not be related to other measurement units.	Discuss distances with which the child is familiar, i.e., the distance from his home to school, to the movies, to the store, etc.
11. Introduce concepts of weight relationships.	Make simple comparisons showing differences in the weight of like objects with a different density; i.e., full and empty cans or milk cartons. Compare class members' weights and a common unit, such as a sand bag. Introduce the pound unit and weigh a variety of objects for comparisons. Demonstrate that bulk and weight are not synonymous.	Determine individual class members' weights to the nearest pound on a balance scale. Tabulate weights of commonly used objects. Determine weights of different materials of equal bulk, e.g., equal size containers, one filled with corn kernels, the other with popcorn. Weigh commonly used assorted objects, e.g., milk, sugar, candy. Weigh a bag of large nails and compare in numbers with a like weight of small nails.
12. Develop concepts of temperature difference.	Discuss hot, warm, cool, and cold in general terms. Discuss temperature differences and relate these to the weather. Compare seasonal changes. Discuss clothing requirements for different temperature conditions.	Keep a log of temperature and general weather changes. Display pictures showing temperature and weather changes through the seasons on the bulletin board. Display pictures of clothing appropriate for each season.

SUGGESTED CURRICULUM CONTENT

INTERMEDIATE LEVEL

CURRICULUM CONTENT-INTERMEDIATE

Arithmetic Concept	Concept Development	Concept Application
1. Numbers as a means of identification and order.	Although the home telephone number, home address, zip code number, bus route number, etc., have been taught, they need to be constantly referred to and checked on.* *Numbers are used to order, regulate, and direct our daily living. It would be of great benefit to the EMR to become familiar and competent in their use.	Let each pupil contribute examples of identification numbers and show illustrative pictures. Examples could be: 1. Auto license 2. Plane identification numbers 3. Highway designations 4. Book pages 5. Telephone numbers 6. House numbers 7. Dog license 8. Theatre tickets 9. Raffle tickets 10. Calendar 11. School locker numbers 12. Bicycle registration 13. Gallon meter on gasoline pumps 14. Dart game scoring 15. Floor numbers in a building 16. TV channels 17. Radio station numbers 18. Phonograph record number (45, 33 1/3, 78) 19. Menu numbers at drive-ins 20. Juke box selections
2. Reiterate the concept of cardinal numbers and expand to fifty.	The concept and use of ordinal numbers should be developed concurrently with cardinal numbers by a. Manipulating situations in the classroom so their use is required. b. Demonstrating the use of ordinal numbers frequently. Employ number games that will emphasize counting, number recognition, and the use of Arabic symbols. Symbols could include Bingo-type games, games of Fish,	Use playground and classroom games that will reinforce the development of numbers and number symbols. a. Bingo or Lotto b. Counting objects in a guessing game, i.e., M & M's or jelly beans in a jar. The closest guess wins and shares the candy with the class by counting

Arithmetic Concept	Concept Development	Concept Application
	a number line where numbers are out of sequence, a number board which can be filled by the class members in sequence according to the number tag each pupil holds. This could be reversed so the first tag hung would be #50.	out so many to each child. Note: the number of beans in the jar should be at this stage, below 50. As the use of numbers increases in scope, the number of M & M's or jelly beans in the jar could be increased accordingly. Pupils should be encouraged to use numerical expressions (cardinal and original) in the proper manner: Say them, write them, and select them appropriately. A teacher must always be alert to capitalize on situations that will enrich the number concepts as they arise in the classroom, on trips, or on the playground.
3. Introduce the concept of place values concurrently with cardinal numbers above ten but below 100.	Use concrete methods of establishing the place value of tens, e.g., a series of ten separate popsicle sticks can be grouped and held together with a rubber band to form one bundle of ten. This can be done for another group of ten sticks, etc. Pupils may recognize that one bundle remains ten but one bundle plus seven separate sticks would be one ten and seven ones or seventeen.	Pupils should frequently practice expressing numbers over ten as so many tens and so many ones. Numbers should be written in columns. Lined paper turned lengthwise will help keep the numerals separate and in straight lines.
4. Introduce the concept of sets in multiplication and division, through 2's, 5's, and 10's.	Sets may be used to develop concepts of multiplication and division. This expands on the idea of place values in tens. Pupils can group objects into pairs by	Pupils should count by twos in reading the thermometer. This may be practiced by using a large model thermometer with a movable red tape to indicate two-degree temperature gradations.

Arithmetic Concept	Concept Development	Concept Application
	placing them in plastic bags. This demonstrates sets as units, but pupils still see the components of each set. Using a clock, nickels, and other units of five, illustrate and have the class participate in counting sets of fives. Use money to involve pupils in a series of exercises and problems that use base ten, or sets of ten. Discuss and illustrate that division is merely subtraction of sets. This is parallel to the concept of multiplication as a short-cut to long addition of sets.	Counting by 2's, adding by 2's, and multiplying by 2's could be accomplished using a variety of concrete objects, (sticks, blocks, candy), using graphic representations of these objects and finally using numerical symbols. In applying the concept of 5's and 10's the counting in sets could be done with stacks of pennies as well as nickels and dimes. Hands, fingers, and toes are also a logical application of the base 5 or base 10. Use the game of Lotto to provide drill in multiplication and division.
5. Introduce fractions as a concept.	Expand the concept of more or less than the whole. Demonstrate with pans of water or sand. Develop the more or less concept to include ½, 1/3 and ¼. The fraction concept is related to division. This can be developed by group sharing; i.e., candy, fruit, cookies, etc.	Pupils should be led to discuss the fact that we often deal in parts of the whole. They should be encouraged to name articles and commodities that can be bought or used in quantities of this sort. Examples should include: a. sugar b. flour c. sand and gravel d. eggs (½ dozen) e. gasoline Pupils can assemble paper or wood cut-outs that have been prepared in fractional parts. Quart, pint, and gallon containers can be filled with popcorn, water, or sand and the relative quantities compared.

Arithmetic Concept	Concept Development	Concept Application
		A quantity of an easily divisible commodity (jelly beans, cookies, apples) could be evenly divided among class members.
6. Introduce the concepts of "add to," and "take away from," or addition and subtraction, without carrying or borrowing.	Demonstrate graphically the functions of addition and subtraction. (a) Stand class members in a line and have various numbers take their seats, e.g. if five are standing and two are sitting down, three are left, etc. (b) Manipulate objects such as balls, blocks, toys, cookies, etc. Use concrete objects to demonstrate addition and subtraction in conjunction with Arabic symbols on a flannel board or blackboard.	Buying candy, ice cream, etc., and making change. Payment for small chores would involve addition. Roll call of number present compared with total enrollment. The number of students in the classroom can be added to the number of members of another class and compared with the seats available on a school bus. Make meaningful application of addition and subtraction. Use concrete examples expressed with parallel Arabic symbols.
7. Expand the concept of addition and subtraction to include carrying and borrowing.	Carrying in addition may be reinforced and greater meaning given to place values by the use of concrete teaching aids (bundles of sticks). The technique of borrowing, when demonstrated through concrete objects, should likewise support the concept of place values. Note: Considerable time and effort will be required to establish and reinforce the concepts of carrying and borrowing.	Given the problem of adding seven and five it can be demonstrated that seven sticks and three more would make a bundle of ten, or one ten. The one would then be written in tens place as 1. This would leave two sticks which are represented by the numeral 2, written in one's place. We now have the number 12.

Arithmetic Concept	Concept Development	Concept Application
		In a subtraction problem where seven is to be "taken away" from twenty-five, it is readily seen that since seven is greater than five, it is impossible to effect subtraction. However, by "borrowing" one bundle of tens from the two tens in twenty-five, we can increase the five to a fifteen. It is now possible to "take away" seven from the fifteen, leaving eight sticks. Since there is one bundle of tens remaining after borrowing, our result is one ten and eight ones, or eighteen (18).
8. Develop the concept of money and its uses.	Introduce the idea that money is a convenient way to obtain: a. Services 1. barber shop 2. movies 3. roller rink 4. sport events b. Goods 1. candy 2. cars 3. clothing 4. toys Discuss the use of money as security a. Banking 1. checking accounts 2. savings accounts Discuss the comparable values of coins,	As an introduction to a unit on money, a film or series of films could be used. Examples are: The Unit, Money and Its Uses, and Making Change for a Dollar. Pupils can compile uses of money and categorize them as goods or services. The value of money as security can be as elementary as the feeling of well being if there are a few coins in one's pocket. Pupils can discuss this and hopefully come to the conclusion that there is some value to saving. This could be applied by establishing a savings account for each pupil. A classroom commissary stocked with penny, nickel, and dime items could be "opened" one or two days a week

Arithmetic Concept	Concept Development	Concept Application
	e.g., five pennies are equal to one nickel, two nickels are comparable in value to a dime, a dime has the same value as ten pennies, etc. Establish the use of the decimal point in writing monetary amounts, e.g., \$1.00; \$.53; \$.06, etc. Continue instructing in addition and subtraction of money. Use actual coins. pictures of money, and Arabic symbols to facilitate transfer of the concept from a concrete to an abstract form. Although it is too early for an involved discussion of comparison buying and "best buys," some discussion of "getting your money's worth" is appropriate.	with class members rotating as storekeeper. Items should be purchased with real money. This will have a two-fold effect: 1. experience of using money 2. making decisions as to what is valuable to the individual. Pupils can demonstrate mastery by doing more formal problems involving addition and subtraction of money.
9. Introduce the concept of time and its measurement.	Reinforce earlier instruction on time by going over the basics of reading a calendar for month, day, and year. Introduce the month, week, and day as related units. The month and year could be related at this time, but no emphasis should be given to any further relationship with the year. Make calendars indicating the names of the seven days, and correctly number them for the month. Include a demonstration of what a ½ year is. Indicate that six months and ½ year are the same.	Using a calendar large enough to be easily seen by the entire class, have each child turn to his birth month and indicate his birthday. This information may be entered on the school canendar to a party can be held at the appropriate time. The day of the week, date, and year should be placed on the blackboard daily. Class paper work should include this information as well as the pupil's full name. Continue to use field trips during all seasons to observe plant and wild life, for appropriate

Arithmetic Concept	Concept Development	Concept Application
	Continue to reinforce and strengthen the use of seasonal terms; summer, fall, winter, and spring.	recreation and to gather plant specimens.
	Discuss the day and begin a discussion of parts of a day as a prelude to introducing the clock. This would include am and pm, morning and afternoon.	Involve pupils in a discussion of their typical a.m. and p.m. activities at school and at home.
	Using a large clock face graduated 1-12, introduce the reading of time in whole hours.	Each child can make his own clock face from a paper plate, two pieces of tag board for hands, and a paper fastener.
	The teacher can set the clock at several whole hour times. Pupils may follow her actions on their individual clock faces.	During the school day each child should be asked at least once what time it is.
	Continue clock reading in ½ and ¼ hour units. Some pupils may be able to relate to 15, 30, and 45 minutes to these fractions of an hour.	Have students take turns reminding the teacher about various activities during the day by using a time schedule and reading the clock.
	By the end of the intermediate school experience, the child should be capable of reading the clock to the nearest five minutes.	Encourage pupils to express time in terms which make reading the clock necessary.
	Introduce the hour and parts of an hour as relative time units, e.g., "In an ½ hour we will go to the playground." or, "You may all have five minutes of playtime." And "The trip will start at ten o'clock and will take three hours."	Introduce problem-solving situations which use time units: (a) What time will it be in a ½ hour? 2½ hours? Five minutes? (b) Determining time differences, e.g., "How long does it take to get to school if you start at 8:00 a.m. and arrive at 8:30 a.m.

Arithmetic Concept	Concept Development	Concept Application
10. Introduce the concept that time has a relationship to other measurable units.	Discuss the terms fast, slow, faster, earlier than, later than. Introduce time and distance as related expressions: (a) miles per hour (mph) (b) revolutions per minute (rpm) Develop miles per hour and revolutions per minute in context meaningful to the EMR, C.A. 9-12 years. For example, the 45 record is the one used for most teen-age music. The number of times this revolves in a minute would be an idea a child of this age could assimilate. From this, more complicated examples could be used, the RPM's of an auto engine being the most appropriate. In matters of m.p.h., the relationship of miles traveled in the space of an hour's time should cause no special difficulty. In any case, the problems and examples must be kept meaningful and uncomplicated.	Discuss and estimate the time it takes to travel distances by various means of transportation. Use two points of common knowledge, e.g., school to a park, another school, a nearby town, a child's home, etc. Have pupils read numbers from an auto speedometer. Utilize simple time-distance problems to strengthen the concept. Problems could be similar to the following: If it takes us two hours to walk around the lake, and the path is four miles long, how many miles per hour were we walking? Also, if we drive at 20 mph, and we travel for three hours, how far did we go?
11. Introduce the inch and foot as related linear units of measurement.	Demonstrate the relationship of the foot and inch and show that 12 inches is the same as one foot. Have pupils measure lines, squares, and triangles that have been dittoed or mimeographed. Have pupils draw lines and geometric figures to full inch dimensions. Paper and ruler will be necessary.	Use a ruler graduated in whole inches, only to measure familiar objects such as books, tablets, the window opening, classroom floor, etc. Measure the height of class members and enter these statistics on the weight scale. Compute the above as whole inches and as foot-inch combinations.

Arithmetic Concept	Concept Development	Concept Application
12. Introduce estimation of linear dimensions.	Discuss situations where estimation of measurement is sufficiently accurate and situations where greater accuracy is needed. Estimations could include: (a) height of a tree (b) width of a stream (c) people (d) baseball throw's (e) width of a street (f) wrapping paper used for a package Accurate measurements are needed for: (a) width of a garage door (b) dimensions of a door or window (windows, screen, door, must all fit). (c) room size (d) field sizes for games (e) layout drawing project	Have pupils estimate the dimensions of the development examples, and then check their accuracy by making actual measurements.
13. Introduce the yard as a unit of linear measurement.	Discuss the yard in assorted situations: 1. Sports (a) football (b) golf (c) track (d) marksmanship (e) kite string length 2. Household (a) textiles (yard goods) (b) carpeting	

Arithmetic Concept	Concept Development	Concept Application
14. Introduce the concept of the mile.	It is not necessary to relate the mile to any of the other lesser units of measurement. Discuss distances that are logically measured in miles or half miles: (a) School to home (b) School to points of interest covered in field trips (c) Home to a friend's home (d) Home to the movies or store Use a model or an actual car odometer to show how miles traveled are read and computed.	Use oil company road maps to determine the distances from student's home town to places of interest: (a) Parks (b) Lakes (1) Fishing (2) Swimming (c) Relative's home (d) State capitol Have pupils check the school bus or car odometer before and after a trip to determine accurate distances.
15. Continue developing weight concepts.	Repeat and reinforce the understanding of weight differences gained in primary experiences: (a) Note weight differences of full and empty containers of the same size. (b) Weigh wet and dry sponges and compare differences (use newly conceptualized subtraction techniques for comparison of weight differences). (c) Using a bathroom scale or a balance scale, weigh class members. (d) Weigh a variety of objects to note differences in the density of materials, e.g., balsa wood, lead, feathers, cardboard boxes, bricks, etc. (e) Weigh one component of a whole (one sheet of paper from a tablet) and then the whole and compare. A balance scale can be made from a stick, some	The child should be able to demonstrate awareness and discrimination of weight differences in a variety of situations, e.g., weight differences of various materials (bricks, blocks) or liquid quantities (pint and quart). Make a chart of class member's weights and note fluctations from week to week. Pupils can compile lists of objects that are usually sold by, or measured by weight. This list could be illustrated with pictures. Have pupils check local markets and stores to experience weighing

Arithmetic Concept	Concept Development	Concept Application
	string, and two plastic coffee can lids. (f) Discuss the need for measurement by weight. Expand usage of the pound and include half-pound units. Weigh objects in daily use to cultivate the ability to estimate weights, e.g., a bag of potatoes, margerine, sugar, flour, vegetables.	produce. Practice using the scale to weigh persons or objects. The scale should read to the half pound.
16. Introduce the concepts of dozen and half dozen.	Introduce the concept of a dozen by specifying some of the articles that are usually grouped in this manner: (a) Count the spaces in an egg carton (b) Count the pencils in a pencil box	Have pupils check stores to determine which articles are commonly sold by the dozen. Have pupils note which articles may be sold by either the pound or by the dozen. Let individuals group objects by dozen and half dozen lots, e.g., blocks, candies, marbles, popsicle sticks, etc.
17. Expand the concept of temperature and its measurements.	Reiterate concepts of hot and cold, warm and cool with meaningful demonstrations. Relate these to: (a) body temperature and body comfort (b) seasonal climatic change (c) cooking and refrigeration Introduce the Fahrenheit thermometer and indicate the freezing and boiling points on the Fahrenheit scale.	Keep a weather chart. Record temperatures at specified times during the day and make annotations on conditions. Make charts of seasonal weather changes. Couple with pictures of appropriate clothing for the seasons and typical outdoor recreation, e.g., swimming in summer, skating in winter, etc.

Arithmetic Concept	Concept Development	Concept Application
	Introduce the medical thermometer and explain how it is used. Pupils at this level need only determine whether their temperature is above normal, normal, or below normal. Reading the gradations accurately at this stage is unrealistic. Relate body temperature to health, e.g., temperatures registered on medical thermometers as above or below (especially above) normal indicate illness. Demonstrate that body temperature can be estimated by feeling the forehead.	Have pupils demonstrate their ability to read a thermometer by taking turns keeping the above records. Discuss the need for heat and cold in food preparation and preservation. Pupils can participate in field trips to food processing plants: cereal manufacturers, canneries, meat processers, fruit storage areas, freezer plants. Oral reports should be made on a tape recorder. A master tape could be made and used with picture displays in an assembly program or at a PTA meeting.

SUGGESTED CURRICULUM CONTENT

JUNIOR HIGH LEVEL

CURRICULUM CONTENT-JUNIOR HIGH

Arithmetic Content	Concept Development	Concept Application
1. Develop greater competence in the use of cardinal and ordinal numbers from one to one hundred and above.	Discuss uses of numbers involving numbers greater than one hundred. Examples of these could include auto speeds, money, house numbers, distances in miles, etc.	Involve the class in games of Bingo, Lotto, dominoes and similar activities which require number recognition.
2. Expand the concept of numbers in multiplication and division to include tables one through ten.	A. Although the concept of three 4's can be demonstrated and the child can learn to compute the answer, rote learning is likely to be the most operational way of learning the multiplication tables. B. Long multiplication and division should be introduced and drill in the technique provided. The junior high pupil should have developed sufficient tolerance for pure math problems to allow practice of these computations.	A. Flash cards, Lotto and Bingo games and drill type games that utilize multiplication and division will strengthen knowledge of these facts. B. The application of multiplication and division techniques should be made in straight number problems as well as situation problems. The EMR will have difficulty transferring his acquired technique to abstract situations, so problems should be as meaningful as possible and cover a variety of situations.
3. Introduce the concept of 0 in addition and subtraction.	Developing a concept of the abstract 0 is easier if concrete teaching aids are utilized. These could be blocks, sticks or containers, e.g., if one has a partially filled container, and nothing is added to it, it is still partially filled; therefore, nothing added to something has not changed its condition. A similar situation could be demonstrated with the subtraction of 0.	Application of the 0 concept in subtraction and addition could be accomplished through the computation of problems. Concrete teaching aids similar to those used in development may be used.

Arithmetic Content	Concept Development	Concept Application
4. Develop the concept of addition and subtraction of numbers involving three or more numerals.	Adding more than two two-digit numbers can be difficult for the EMR. This development should be largely based on drill. Keep the problems meaningful.	It is possible to use an oil company road map to make practical applications of addition problems. Add the milages between towns to get the total distance from one place to another.
5. Expand the concept of money and its uses.	A. Discuss money as it relates directly to the individual; how the adolescent EMR will get money and how he will use it. a. Allowance from parents b. Earned funds (1) baby sitting (2) paper route (3) odd jobs c. Use of money (1) Budgeting for regular expenses (a) lunches (b) entertainment (c) church (d) cosmetics (girls) (e) barber (boys) (f) transportation (g) clothing (h) banking d. In discussions concerning the use of money it is well to manipulate responses so that pupils	A. It is hoped that the EMR junior high boy or girl will realistically demonstrate awareness of the use of money by applying the budget he arranges for himself in class to his regular spending habits. Techniques of making change, recognizing money, and counting money should be practiced frequently in classroom exercises using real money.

Arithmetic Concept	Concept Development	Concept Application
	will make points of budgeting and saving, and spending within one's own means (not borrowing from other pupils). This will be more effective than the teacher's "preaching."	B. Let pupils list occupations and enter on a chart their agreed estimate of the earnings of each job or profession. Each pupil could realistically be assigned to inquire what the daily, weekly, monthly, or yearly earnings would be for each and relate them on the basis of gross yearly income.
	B. Discuss the uses of money: how we get it and how we use it. a. money earned as compensation (pay) for work. (1) clerk in store (2) waitress (a) salary (b) tips (3) factory worker (4) farmer (5) teacher (6) truck driver b. Money used to buy (1) services (a) utilities (b) movies (c) barber or beauty shop (d) sporting events	

Arithmetic Concept

Concept Development

(2) goods

- (a) food and candy
- (b) clothing
- (c) cars
- (d) jewelry

(3) money used for security

- (a) savings
- (b) checking

C. Discuss the basic needs of a family

- a. Food
- b. Clothing
- c. Shelter
- d. Transportation
- e. Savings

D. Discuss the concept of security. Have the pupils discover through their own discussion what the purpose of savings is. The teacher should moderate the discussion, not monopolize it; the ideas must come from the class.

E. Discuss the pros and cons of purchasing very inexpensive merchandise. For instance, it can be graphically

Concept Application

C. Each pupil (or committees of three) should draw up a chart showing the financial needs of a family over a year. These could be compared and a master schedule of major expenses compiled. Compare with national figures.

D. Take pupils on a field trip to a bank so they can see the procedure for filling out deposit and withdrawal slips. Have a bank official explain different kinds of interest for savings accounts and why no interest is given for checking accounts. (Note: the bank should be alerted to the visit and the person who will speak to the students made cognizant of the intellectual limits of his audience. For example, an explanation of interest should be very simple and basic, without going into percentages and compound interest.

E. Take the class on a comparison shopping tour of grocery stores, department stores and a discount house. Encourage the pupils to make honest evaluations of the

Arithmetic Content	Concept Development	Concept Application
	demonstrated that some clothing articles are of poor quality cloth, have poorly sewn seams, mismatched patterms, badly finished buttons and buttonholes, and are usually skimpily cut. The cost of cheap clothing, compared with its wearing qualities, actually makes it more expensive than clothes that cost a little more initially. It should also be pointed out that cheap, high style "fad" clothing is usually the worst buy of all.	merchandise with relation to the price. Get check blanks from a bank and start each pupil with a "deposit" of a thousand dollars. Each day have them buy articles of their own choice, pay for services (phone, lights, gas, etc.). Each week a realistic "deposit" representing wages should be made. A certain part of the wages should be indicated for savings. This will provide exercises in addition, subtraction, multiplication, and division.
5b. Introduce money related number concepts.	A. The Social Security Number is an identification all working people must have. Discuss its purpose and use in identifying each working person in the United States for purposes of social security, income taxes, driver's license, etc. B. Pupils should be instructed in the filling out of an application for the Social Security Number and it must be impressed on them that the identification card should always be carried and not be lost.	Obtain forms for Social Security numbers from the Post Office and have each pupil complete the form. Those who do not have Social Security numbers should send these in and secure their identification. Each pupil should, by this age, carry a billfold for the purpose of carrying money and his assorted identification cards. It should be demonstrated to the teacher that these are carried safely at all times.
6. Expand the use of numbers in measurement of time.	A. Expand hours to days, days to weeks, and months to years. B. Demonstrate and have the pupils practice reading the clock or watch and use such terms as: (a) quarter past (b) 15 minutes past	All written work to be handed in should have the full name, school, and date on it. Each day the date and the day should be on the blackboard. Pupils can demonstrate time awareness by getting to school and to classes "on time". Each pupil

rithmetic Content	Concept Development	Concept Application
	(c) half past (d) 30 minutes after or before (e) quarter of (f) ______:07 (g) ______:20 (h) ______:30 (i) ______:40 (j)_______:50 C. Begin using seconds. D. Explain the terms B.C. and A.D., along with the term "century" in a brief manner.	could preare a schedule of his day, giving the times he performs certain activities and estimating the time he spends on each one, e.g., "Get up, dress, and wash for breakfast, 7:30 a.m., 15 minutes." Have pupils use a watch or clock with a sweep second hand, or a stop watch to time each other in assorted activities, e.g., sports events, doing chores, doing math problems.
. Expand the concept of numbers used in time related units.	Time related units most meaningful to the adolescent would be miles per hour. Hot rods, road racers, Indy cars, and other car-related activities are highly motivating. Utilize this in problems. RPM's (revolutions per minute) are almost as important as m.p.h. Problems utilizing this term could be used in the same manner.	Develop problems using mph. It takes three hours to drive from here to Des Moines, and Des Moines is 150 miles away; what speed have we been driving? Or, if a car is driven for four hours at 70 how far will it travel? Pupils might compile a chart of cruising speeds using various means of travel: walking, horseback riding, bicycle, motor bike and motorcycle, automobile, train, airplane (prop and jet), bus, rocket. Speed records could be coordinated with some of these. Also, speed records in sporting events (skiing, auto racing, flying, etc.) and records of elapsed time from one place to another could be listed and illustrated. A whole unit on methods of travel and the evolution of transportation could be developed.

Arithmetic Content	Concept Development	Concept Application
		Specify a journey from the pupil's home town to a place of special interest. The time necessary for various means should be computed and various costs determined. Exercises in this area should be controlled and should not become too involved or complicated. Distances and times should be rounded off for easy computing.
8. Expand the concept of numbers used in the expression of linear measurement.	A. Review the use of the foot and the relationship to the inch. Use the foot and inch to measure a variety of objects within the class' sphere of experience, e.g., class members' heights, blocks, boards, geometric figures prepared for this exercise, etc. Each pupil should learn his clothing sizes and be able to use these in shopping trips. Boys should know the following sizes: underwear, socks, shoes, trouser waist and leg length, and shirt collar and sleeve length. Girls should know the following sizes: bra, girdle, stocking (foot and length), shoe, blouse, skirt, dress, and glove. B. Have pupils use a variety of measuring tools for their projects, i.e., foot ruler, yard stick, carpenter's tape, tape measure, and folding rule.	A. The measurement of objects, in this case, would develop the concept and apply it. As with the other skills, the teacher of the EMR should involve pupils in these assorted activities constantly to provide repetition. B. Girls could demonstrate their ability in the use of the tape measure and foot rule by measuring materials for a sewing project. Boys can apply measurement skills by computing the amount of lumber needed (in linear measurement) for shop projects. A ruler or carpenter's rule would be necessary. C. Pupils could estimate the distance they can throw a baseball, the width of a street,

Arithmetic Content	Concept Development	Concept Application
	C. The yard should be presented as a unit related to the foot and examples of its uses listed: carpet material, clothing material (yard goods), sporting events. Measurements of these articles could be estimated before accurate measurements were taken with a yard stick or ruler.	the height of a person; then check by actual measurement.
9. Expand the use of the mile as a concept in the use of numbers.	Relate the mile concept to a distance that the pupil actually experiences, e.g., "It is a mile from school to____. (A familiar place about a mile away). The mile should be developed as a measurement unit separate from the foot and the yard. Discuss the mile as a measurement unit: a. need a big unit for measuring greater sizes of space and distance. b. To indicate speed (mph) c. to indicate distances Demonstrate the function and use of the odometer. If possible, have an odometer from an old car mounted so the mileage can be changed.	From road signs, maps, and a car odometer, calculate and list distances that could be of interest and importance to the EMR, e.g., the distance from home to school, other towns, across the country, around the world, etc.
10. Develop the use of numbers in measuring weight.	A. Involve the pupils in situations where a weight measurement is necessary, e.g. a. field trips (1) truck weighing station (2) cannery (3) concrete ready-mix plant (4) grocery store	A. Each pupil could contribute pictures illustrating situations where weight measurements are important. A similar project might show examples of different types of weighing devices (modern and ancient).

Arithmetic Content	Concept Development	Concept Application
	b. an experimental project involving a survey of comparative weights of materials. B. Develop the ability to weigh in fractions of pounds (¼,½, 3/4). Use visual aids to demonstrate the weighing of very heavy objects (truck scales) and extremely light substances (pharmacist's scales). C. Introduce critical consumer buying with a comparison of weights and cost of different brands. This would have to be introduced in a superficial way at this level. However, consumer buying is important to all of us, and with the EMR's usually limited financial resources, this is especially so. A demonstration comparing the weight of different brands of dry dog food in similar size-appearing packages would illustrate the need for reading labels and comparing prices. The advantages of buying in quantity could also be demonstrated. Other examples could serve as well. For instance, dry cereals compared with cooked cereals.	B. Each pupil could be assigned a box full of objects varying in density. Their project would be to weigh each object in the box, piece by piece, and add these weights to obtain a total. They could check their results by weighing the entire box of objects. C. Comparison shopping in local stores on a field trip. Pupils could write down brands, weights, and prices comparing "best buys" once back in the classroom. Students can investigate the effect of an accumulation on a number of like objects. For instance, they might weigh one grain of corn and compare it with a can full of kernels.
11. Expand the use of numbers in measurement of temperature.	In general, the use of the thermometer should have been mastered by the end of the intermediate school experience. The development and application of the concept as outlined in the intermediate level could be repeated if the need is apparent. Problems involving	

Arithmetic Content	Concept Development	Concept Application
	the use of the thermometer and temperatures could be included in the arithmetic experience of pupils beyond the intermediate level. Problems could range from simple reading of a thermometer and keeping a temperature chart to those involving addition, subtraction, multiplication and division.	

SUGGESTED CURRICULUM CONTENT

SENIOR HIGH LEVEL

CURRICULUM CONTENT-SENIOR HIGH

Arithmetic Concept	Concept Development	Concept Application
1. Strengthen the concept and use of cardinal and ordinal numbers.	In senior high, the EMR should be capable of writing in symbol form, and reading sumbols and written numbers from 1 to 1,000,000. Provide the opportunity to write numbers in work form. The most logical and meaningful use of written numbers for the EMR will be writing checks.	It will be necessary for the EMR to write numbers of varying amounts. Both symbol and written form should be included. The latter is necessary for banking activities and understanding newspaper accounts of local governmental expenditures for schools, roads, etc.
2. Strengthen the concept of addition and subtraction of numbers.	Develop basic computation skills by involving pupils in problem solving situations which require addition and subtraction. These situations will become apparent as pupils move through sequential development of number concepts and usage. This development must include a variety of problems involving money, time, weight, measure, and other appropriate number uses.	The teacher of the EMR must be constantly aware of his pupil's need to cope with mathematics. Skills should be realistic to vocational and social needs in adult life. One measure of validity is the teacher's own use of the skill in daily life, e.g., does the teacher ever have need of performing square root operations outside of the classroom? Addition and subtraction skills will be evident in virtually every form of applied mathematics. There is value in a very limited amount of drill. Repetition has its place with the EMR, although it must not be carried too far. Workbooks prepared for retarded classes are valuable in providing a reasonable amount of this drill. However, the transfer of a mathematical skill from a workbook exercise to a problem one faces in a work situation

Arithmetic Concept	Concept Development	Concept Application
		or at home requires involvement of pupils in real situations. For this reason, workbooks have limited value and must be used with discretion and selectivity. The workbook or text should be an aid to reaching an end. The text should not determine the curriculum.
3. Strengthen the concept of numbers in multiplication and division.	There will be need for continued drill and problems involving techniques of multiplication and division. Utilize examples that are realistically motivated for the EMR of high school age. These could include problems directly applicable to a job the pupil has expressed interest in, e.g., multiplication and division associated with materials for bakeries, drive-in attendants, farmers, custodians, etc.	A favorite game of many EMR high school pupils is Lotto. This Bingo-type game uses either multiplication or division. The more able can "play" two or more cards at once. Employers of work-study pupils should involve their trainees in problems solving situations on the job to give greater meaning to their mathematical manipulations. As an aid in solving problems, each pupil should develop a multiplication table for reference. They are often printed on tablets and notebooks, but it is recommended that each pupil formulate his own, and use it. Workbooks and texts prepared for the EMR will present multiplication and division problems varying in degree of difficulty.

Arithmetic Concept	Concept Development	Concept Application
		These are valuable if the teacher is able to review the exercise objectives and determine if they fall within the abilities and needs of his pupils. A workbook need not be used in its entirety if it does not provide appropriate activities.
4. Introduce money as related to time payments, credit, and loans.	The concepts of credit, loans, and time payments should be covered carefully. This may be a difficult subject to present, especially when convincing advertising from loan companies and the "no money down" come-ons for purchasing merchandise undermine the teacher's efforts. The teacher should obtain sample loan and time payment contracts. A presentation should be prepared which would show the actual dollar cost of repaying a loan company and the accumulated charges associated with time payments. The difference between bank and loan company charges should also be compared. The hazards of becoming involved with illegal money lenders should be emphasized.	The class can use the duplication materials issued by the Cooperative Extension Service (Auburn University, Auburn, Alabama), in cooperation with the Federal Extension Service U.S. Department of Agriculture. These materials have been included in the Special Education Curriculum Development Center's publication, Homemaking for the Educable Mentally Retarded Girl. The following circulars would be of special value: (a) Circular HE59, Reasons for and against Credit (b) Circular HE58, Should You use Credit? (c) Circular HE57, What is Credit? The following worksheets would provide valuable experience in dealing with credit buying. They are also associated with lessons in Homemaking for the Educable Mentally Retarded Girl. Worksheet for Lesson #4, Section II: (a) How to Figure the Dollar Cost of Credit: Example 1.

Arithmetic Concept	Concept Development	Concept Application
		(b) *How to Figure the Dollar Cost of Credit*: Example 2 (c) *How to Figure the Dollar Cost of Credit:* Example 3
5. Expand the concepts of critical buying and money management.	Instigate a discussion of buying habits with reference to critical appraisal of price labels, quantities, sales, buying in season, buying out of season, etc. Pupils should be thoroughly instructed and given exercises in reading labels and specifications to help determine relative values of foods, clothing, appliances, etc.	Let each student use a newspaper or sales flyer to find examples of articles that are for sale for $4.98, $9.99, or "Only $98.99." Encourage students to try to discover the trick in this form of pricing. Type faces may emphasize the dollar figure and deemphasize the cents. Using newspapers, flyers, and sales catalogs, have pupils compare prices of various articles in and out of season. It should be noticed, for instance, that clothing is available more economically at the end of a season than it is at the start. However, fruits and vegetables are usually more economical during the height of the season. The same project could include the relative value of sale articles and buying in quantity. Utilize the Special Education Curriculum Development Center's publication, *Homemaking for the Educable Mentally Retarded Girl*. Sample lessons which could apply are:

Arithmetic Concept	Concept Development	Concept Application
		(a) Sample Lesson #2, Section III. Purchasing Food. (b) Worksheet for Lesson #2 Section III Food, Money, and Work (c) Worksheet for Lesson 2 Section III Food for the Jacksons Use texts and workbooks specially prepared for the EMR to familiarize him with money in its many contexts. Such publications are: (a) Useful Arithmetic (b) Money Makes Sense (c) The Money You Spend (d) Arithmetic That We Need (e) Everyday Business
6. The money concept, change-making.	The EMR pupil has need of frequent experiences in handling money and making change. Many of these young people may have jobs which will require making change, so this is a very real skill to be developed and is important to all people to know that the change they receive is correct.	Every effort should be expended to make change-making realistic. The first step is to use real money whenever practical. The difficulty of using real money in some problems is apparent. In some situations, plastic play money could be substituted. In others, the use of workbooks may be indicated.

Arithmetic Concept	Concept Development	Concept Application
7. Strengthen the banking concept. Include checking and savings.	Discuss the advantages and disadvantages of a checking account. (a) Record of expenditures (b) Canceled check is a receipt (c) No need to carry large amounts of money (d) Can pay monthly accounts by mail (e) Need for ability to balance account (f) Service charges (g) Easy to overdraw Discuss in similar fashion the advantages of regular saving. The points to be stressed could include the following: (a) Money for emergencies (b) Saving for a special need (c) Interest	Use voided blank check from a bank for practice. Have each pupil "deposit" a large sum to provide a balance to work from. Each week additional payroll "deposits," appropriate to the work which interests the pupil, should be entered. Weekly payments for various services and merchandise representative of normal living costs should be made by check and the books kept in balance. If done realistically, this will provide a meaningful experience in dealing with funds in a checking account. Obtain deposit slips from a bank and have pupils practice filling them out. Use a bank employee as a resource person to motivate interest in a trip to a bank. Observe normal banking functions during the trip. The bank representative should state the purposes of checking and savings accounts and the general theory of interest in a simple manner. Actual percentages and the mechanics of compound interest are irrelevant.
8. Strengthen and expand the use of numbers as expressed in money.	1. Discuss personal uses of money A. Where money comes from (1) Allowance from parents Note: It should be mentioned that	1. Students participating in work-study programs are not always paid; this depends on the policy established in the district. In situations where pupils receive a wage, they should be required

Arithmetic Concept	Concept Development	Concept Application
	although parents have the responsibility to furnish an allowance commensurate with the financial situation of the family, the son or daughter has a like responsibility to the family.	to follow a budget, at least so far as their food, transportation, clothing, and savings are concerned.
	(2) Earned cash (a) work-study job (b) baby-sitting (c) paper route (d) lawn mowing (e) agriculture (f) odd jobs	Each pupil should keep a running account of his expenditures over several months. Most EMR's (and many normal adults as well) have little idea of where their money goes unless it is strictly recorded.
	B. Where money goes (1) barber (2) church (3) clothing (4) cosmetics and beauty care (5) entertainment (6) lunches (7) room and board (8) savings (9) transportation (and car maintenance; gas, etc.)	2. The class, in committees, should make budgets for fictitious families receiving wages of varying amounts. Three levels within the scope of understanding of the EMR and representative of the income levels of many pupils are: (a) A family of four (on welfare) with a monthly gross income of $250. (b) A family of four with a gross income of $350 monthly. (c) An income of $500 monthly for a family of four.
	2. Discuss the family uses of money A. Total salary (1) paid weekly, bi-weekly, monthly	

Arithmetic Concept	Concept Development	Concept Application
	(2) Deductions (a) Social Security (b) Withholding tax (c) State Income Tax (d) Hospitalization (e) Retirement (f) Miscellaneous B. Net Salary (Note: It is especially important that the teacher communicate the difference between net and gross salary. (1) Uses of salary (a) Food (b) Rent (c) Utilities (electricity, fuel oil, gas, water, telephone). (d) Time payments (e) Savings (f) Clothing (g) Medical bills (h) Recreation (i) Transportation (1) Public (2) Private (automobile) (a) maintainance-gasoline (b) time payments (c) insurance (j) Miscellaneous	The results of this exercise should be varied. First of all, the pupils will have gained practice and drill in basic computations of addition, and division. Secondly, they will have realistically applied available resources. Thirdly, it should be clear that the difficulty of meeting even basic requirements for life is drastically increased as income drops to welfare levels. This exercise in budgeting will give the pupils experience in making decisions and cutting or reducing items in order to stay within a limited income. As the wage level drops, they will have to make economizing decisions to squeeze even greater value from available resources. Although $500 may sound like a great monthly bounty to the EMR, when it is divided to meet the necessities of a family of four, little is left for savings, emergencies and recreation. When the income level drops to $250, the pressure to make ends meet becomes depressingly difficult.

Arithmetic Concept	Concept Development	Concept Application
9. Strengthen the concept of time and measurements of time units.	A. Check on pupils' abilities to use a calendar and to compute time units on the calendar, e.g., two weeks from the 15th. of March will be _______, or, 27 days from now will fall on _____, the _____of______.	A. Have the pupils indicate the number of days, weeks, or months that have, or will elapse between the present date and birthdays, vacation days, special events, etc.
	B. Develop the ability to use small time units (minutes and hours) as above.	B. Substitute minutes and hour time units for days and salient hours of the day in problems similar to those above.
	C. Discuss work habits and the need for being "on time" for work.	C. Estimate times required to get from home to work, school, church, downtown, etc. Have pupils take actual times and check estimates.
	D. Explore various methods of keeping track of time spent on the job, e.g. time clock for total work day, time clock for work on specific jobs (such as auto repair shops), informal starting and quitting hours, pay for piece work rather than hours.	D. Have each child chart and budget his day into time units.
	E. Introduce the idea of time-and-a-half and double time. This should promote interest in determining wages at different rates and hours.	E. Take a field trip to manufacturing plants, stores, service shops, etc., to determine their system for recording time: payment of employees and charging of customers.
10. Strengthen and expand the use of numbers in time-related concepts.	A. The junior high level section devoted to miles per hour and revolutions per minute could be repeated in senior high EMR classes.	A. Repeat the problems outlined in the junior high section on mph and rph. These might be expanded to include more difficult problems of computing mph and distances traveled.
	B. In senior high school there is greater awareness of the individual's place in the larger community. This is a social and geographic	B. In addition to computing distances around the world, rates

Arithmetic Concept	Concept Development	Concept Application
	concept. Students might be involved in locating home town or state, country, hemisphere, and world maps. They could then compute distances to points of special interest, e.g., the state capitol, national capitol, West Coast, Viet Nam, etc. A further point may be established; although points within a day's drive from home base should be determined as closely as possible, greater distances need not be computed as accurately. For instance, distances within the country, or North America, could be accepted if stated within a hundred miles, whereas distances on the global scale could be within two or three hundred miles.	representative of different means of travel might be used to compute the travel times required to reach them.
11. Expand the concent of numbers so expressed in linear measurements.	A. A complete review of the inch, foot, and yard including fractional divisions (¼, 1/3, ½, 1/12, 2/3, 3/4) will be necessary. B. Linear measurement skills tailored to the demands of the pupils' desired vocations will serve to individualize needs. Development should satisfy these needs. Work areas might include a carpenter's helper, plumber's helper, sales girl, farmer, feed store clerk, mason's helper, lumber yard helper, etc.	A. Where work-study programs have been instituted, measurement skills required "on the job" can be reinforced and strengthened in related classroom problems. B. Where there is no work-study program, application of measurement skills may be individualized according to the pupil's vocational interests. If these situations do not develop, then as wide a variety of experiences as possible would be appropriate.

Arithmetic Concept	Concept Development	Concept Application
12. Strengthen the use of numbers expressing measurement of weights.	Review and repeat the need for weight measurement. The school experience should provide practice in using at least three types of scales; postal scales for very small weights (ounces and fractions of an ounce); spring scales such as bathroom scales; and balance beam scales of the type used in a doctor's office or a feed store. Discuss the need for legal control of weights. Discuss the health implications of under or over weight.	The EMR will need to practice using various scales. He should be able to demonstrate ability in weighing letters on a postal scale, persons on a spring and balance scales, and foodstuffs on a grocery or market scale. If a truck scale is available for demonstration and use, this would be an added advantage.

NUMBERS AND ME

STARTER UNIT TOPIC
FOR
PRIMARY LEVEL
EDUCABLE MENTALLY RETARDED

UNIT TOPIC: NUMBERS AND ME

I. RATIONALE

From early childhood on the retarded child is required to meet certain arithmetic demands or suffer certain undesirable consequences. If he doesn't make it to the table on time he misses a meal; if he misjudges the distance across the ditch he may fall in; if he doesn't know his home address he may become lost; if he doesn't have a #2 pencil his teacher may scold him; if he incorrectly counts his money he may be cheated. The list of needs and consequences could run on indefinitely.

The fact of the matter is that every child is intimately involved in the world of numbers--a fact that needs special consideration in teaching the retarded in view of his learning difficulties. We may expect that the retarded child, under even the best circumstances, will have difficulties with number and spatial concepts. Thus, there is the need to plan carefully for the thorough inculcation of these concepts into his personal life.

II. SUB-UNITS

A. Our School

B. School Helpers

C. Knowing our Community

D. Workers in our Community

E. Measuring

F. Money

G. Time

H. Telephone

I. Safety

J. Transportation

III. OBJECTIVES

A. To become aware of numbers as means of identification in our personal lives. For example:

1. House numbers
2. Telephone
3. School room number, etc.

B. To learn the use of ordinal numbers in relation to the students' everyday lives. For example:

1. I sit in the first seat of the second row.
2. I am the second oldest in our family.
3. We live in the third house from the corner.

C. To develop the ability to use basic measurement concepts. (Time, distance, weight, etc.). For example:

1. My home is about a mile from school.
2. I am heavier than my sister.
3. My dad is taller than I.
4. I've been waiting for you a long time.

D. To use quantity concepts in relation to daily events. For example:

1. You have more money than I.
2. How many children are going to play ball?
3. I have eight marbles to play with.
4. There are nine children in our family.

2

IV. CORE AREA ACTIVITIES

A. Arithmetic Activities

1. Associate each student's name with his desk and number the desks as a further identification. Also number the rows.
2. Have the students count the number of rows in the room and the number of seats in each row.
3. Draw pictures of the room and the seating arrangement, designating each position by number.
4. Have each child bring his home address and learn it over a period of time by putting the address along with the students' name, seat number and row number on each worksheet.
5. Practice counting various values through ten by worksheets, manipulation of pennies, etc.
6. Develop readiness for time telling by labelling situations as early, late, now, etc.
7. Practice form discrimination using various shapes--triangular, circles, squares, octagon, etc. Relate these shapes to important aspects of the students' lives such as traffic signs, warning signs, etc.
8. Play games that require the ability to handle numbers through ten. (Keeping score, etc.).
9. Promote readiness activities leading to measurement by requiring discrimination between the relative sizes of various objects--big, little, bigger, biggest, etc.
10. List the number of people in the family.
11. Practice counting by groups. There are groups of children in each row, groups of pennies, dogs, etc.
12. List kinds of products that may be bought for a dime or less. Add and subtract values to ten. Relate to store products.

13. Learn the home telephone number.

14. Practice exercises that develop concepts of distance and direction: in front, in back, far, near, etc.

15. Label various objects and people ordinally--I'm the first person in my row. I am the second to the youngest in my family. I was third to get a drink, etc.

B. Social Competency Activities

1. Practice taking turns at being first, second, etc., at the water fountain, games and other social activities.
2. Keep scores of various games played with other children.
3. Collect coins as a group and use them to develop and strengthen addition and subtraction skills.
4. Emphasize the need to tell time so that we won't be late for school, for a bus, or for play appointments with our friends.
5. Play games in which oral instructions are given with reference to numbers. For example: Walk around desk number two three times, go to the second window and pick up four crayons and put them in the first box on desk one. Simpler directions may be necessary at first, but the format of the game is flexible.
6. Make a large illustration of the earth, moon and sun, showing in a general way how seasons and day and night occur.
7. Plant beans in a plant box and chart the amount of time before it begins to protrude above the ground. Tie this in with daily farm life, etc.

8. Construct a class bird house, allowing the class to do the measuring with a ruler.
9. Demonstrate the need for having sizes in clothing by having the children put on clothing that is too big and too small.
10. Make a chart of room duties denoting the days and times of each student's responsibility.

C. Communicative Skills Activities

1. Put home address and telephone number on letters to friends and relatives.
2. Use time concepts in common speaking situations (afternoon, morning, noon, etc.).
3. Play games that require non-verbal communication--like tapping of the foot, gestures, etc.
4. Devise visual discrimination tasks related to form recognition (square, triangle, circle, etc.) and have children refer to these shapes in communicating their ideas.
5. Use terms of relative size in telling of personal experiences. Discuss the meanings of big, bigger, biggest, etc.
6. Require communication to be related in logical chronological order. First we visited the museum, then we...etc.
7. Practice the reproduction of simple geometrical forms by including them in art work.

D. Health Activities

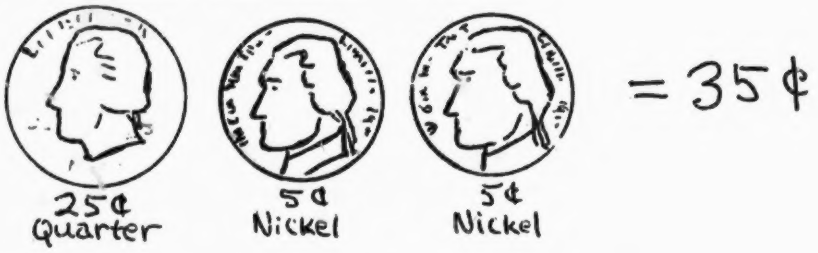
1. Discuss the number of times to brush our teeth daily - - utilize terms such as morning, afternoon and evening.
2. Make a bulletin board relating numbers and health -
   (a) We chew our food twenty times.

(b) We stay at the table for twenty minutes.

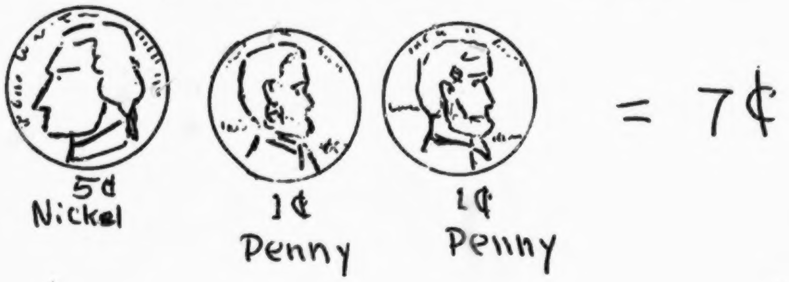
(c) Children need 8 to 10 hours sleep daily.

3. Draw a chart of the coins required to buy milk and lunch - i.e.,

(a) Lunch can be bought with:



(b) Milk can be bought with:



E. Safety Activities

1. Construct a bulletin board illustrating the shapes of important traffic signs.
2. Use dimes to practice using a pay telephone in case of an emergency for calling fire department, police, doctor, etc.
3. Illustrate the dangers of playing with firecrackers because of the short time between lighting and explosion.
4. Demonstrate by pictures what could happen if too much time passes between turning on a gas stove or oven and lighting it. (Explosion).
5. Explain and illustrate the dangers of walking alone late at night - how late is too late, etc.

6. Learn to judge distances in relation to oneself to prevent falling into a ditch or injuring oneself on a high fence, etc. For example: How far can I jump safely?

7. Figure out the amount of money a child should carry in case of emergency:

    (a) Dime for phone

    (b) 25¢ for bus

    (c) 50¢ for food, etc.

F. Vocational Activities

1. Learn and practice to be on time.
2. Begin the development of time and direction concepts needed in occupational pursuits (today, morning, noon, quitting time, left, right, up, down, etc.).
3. Use and pay for local transportation facilities such as bus, train, subway, etc.
4. Begin the development of the sense of value placed on money: how much it will buy, how long it takes to earn, etc.
5. Begin to make small unsupervised purchases with money earned at home or school for work performed.
6. Keep time schedules of classroom duties for the class workers and encourage the children to abide by them.
7. Have the children help plan the amount of space required for keeping various classroom materials and give them practice in arranging various materials into different size spaces.
8. Have children help in cleaning and arranging the room - match the number of the chairs with the number on the desks, etc.
9. List some things that might happen when a worker fails to perform his job. Emphasize the amount of time that is wasted, and the money that is lost to the company.

V. RESOURCE MATERIALS

- Flannel board
- Overhead projector
- Bulletin board materials
- Films and filmstrips
- Games and puzzles
- Money
- Templates and tracing forms
- Cuisennaire rods
- Blocks of various dimensions
- Large calendar
- Experience charts
- Seatwork exercises
- Songs
- Telephone
- T.V.
- Radio
- Class store and store materials
- Magazine pictures
- Field trips
- Camera and film
- Tape recorder
- Clock
- Flash cards

VI. VOCABULARY

- number
- address
- telephone
- street
- desk
- birthday
- seat
- row
- house
- sign
- days of the week
- brother
- sister
- locker
- penny, dollar, etc.
- candy
- milk
- town (name of town)
- calendar
- day
- week
- month
- Names of neighborhood streets
- big
- little
- early
- late
- now
- afternoon
- morning
- for
- near
- close
- penny
- dime
- nickel

Numbers one through ten (cardinal and ordinal)

LESSON #1

SCOPE OF THE LESSON: Involve the pupils in activities and situations which will result in an awareness of their home address as an identifying number.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To participate in a discussion of where we live by making at least one verbal contribution.	1. Introduce the lesson by involving the class in a general discussion of homes and where we live. (a) City or country (b) Farm, house, apartment, duplex (c) One or two story house (d) On a corner or in the middle of a block (e) Color of house (f) Big or small house (g) Home near other children in the class (h) Walk to school or take bus	Drawing paper Pencils Crayons	We all live in a building called home. Our home is our own. It is in a special place called an address. We should know our address.
2. To demonstrate individual involvement in learning about addresses by bringing the home address to school on a piece of paper.	2. Direct each child to bring to class his correct home address (house number, street, town, apartment number if applicable). Note: This should be checked against school records as there may be changes or errors that would need verification.		
3. To graphically demonstrate an awareness of one's own address by drawing and coloring a picture of the home and writing (if capable) the address on the paper.	3. Initiate a project in which each child will make a drawing of his dwelling place. Encourage the children to add the family members, pets, etc., to the drawing.		

4. To verbally exhibit an awareness of one's own address by describing the home to the class and stating the address.	4. Instruct each child to clearly letter his correct address on his drawing. 5. Encourage the pupils to participate in an activity in which each will display the drawing of his home, tell about it and his family and state his address.		
5. To be able to correctly state the home address including the house number, street number, and town on any occasion.	6. Utilize opportunities in class group activities and in individual contact to encourage each child to verbally state his home address.		

LESSON #2

SCOPE OF THE LESSON: Present to the children the need for knowing either their home telephone number of a number from which the parents (or guardian) can be reached.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To become involved in a discussion and play activity by being an active participant.	1. Open a lesson on the telphone with a projected picture of an instrument during which the teacher would encourage discussion of the need and use of the telephone.	Overhead projector or opaque projector	It is nice to be able to use a telephone. We can call our friends.
2. To correctly use the home telephone number verbally and in dialing during a class activity with telephone instruments.	2. Using a pair of play or real instruments demonstrate, with a class member as an assistant, telephone procedure. Include dialing 0 for the operator and verbally stating the number as well as dialing direct.	Slides, transparency or photograph of a telephone instrument. Film strips or movie on	We can call our home. We need to be able to say our telephone number.

3. To know the correct telephone contact with the parent or guardian by stating the number verbally or by dialing the number correctly whenever the occasion demands.	3. Supervise pairs of children as they "call" each other on pairs of phones. The child should say his number so the other child can dial it. They can also pretend calling home, with other children taking the part of the parents.	telephones, if available. Sufficient pairs of play phones for the class. Slide projector	We should know how to dial our numbers.

LESSON #3

SCOPE OF THE LESSON: Emphasize the desirability of knowing one's age and birth date (day, month, year).

Instructional Objectives	Activities	Resource Material	Experience Chart
1. To demonstrate an interest in a discussion of ages and birthdays by making a verbal contribution.	1. Open a discussion on age and birth dates by asking what a birthday is.	Flannel board Figure cut-outs for flannel board.	I have a birthday. Each birthday I am a year older. I am also bigger each year.
2. To show an interest in birthdays by contributing to a planning discussion for birthday parties.	2. Suggest birthday parties for class members and encourage a discussion involving general planning for these.	Birthday calendar	
3. To become involved in a tabulation of birth dates and ages of class members by attempting to name his own age and birthdate. Note: The teacher will need to check her records to verify this.	3. Encourage each child to come to the front of the room and tell his age and birth date and, if possible, to mark it on a large "birthday" calendar. This will involve considerable assistance from the teacher in many cases.	Party materials: favors games refreshments cards	
	4. Use a flannel board with figures of adults, babies, and boys and girls. Prompt the children to represent their families on the board and to indicate their ordinal position among the siblings. If they can not	Student records	

4. To verbalize to the class his ordinal position among the siblings in the family (I am oldest, I am second oldest, etc.)	verbalize this position they should be prompted.	Opaque projector or slide projector.	
	5. Through repetition and frequent questioning assist each child to be able to repeat his age, birth date and sibling position.	Film Pictures of a birthday cake	
5. To be able to state the age, birth date, and ordinal position in the family correctly.	6. Take slide (35 mm) or Polaroid pictures of each party and hold a post-party slide show.	Camera (Polaroid or slide)	

LESSON #4

SCOPE OF THE LESSON: Introduce the concept of difference in linear measurements and distance.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be able to verbalize the differences in lengths of familiar objects.	1. The teacher should involve the children in a comparison discussion in which they would determine the difference in lengths of objects they use daily, e.g., "Is the red crayon or the blue crayon longest?" and "Which pencil is the shortest? This one, or this one?"	Pencils Sticks Crayons Drawing paper	We can see that some things are long, some are short. Some are tall, some are far away. It is nice to be able to tell one from the other.
2. To demonstrate an understanding of differences in linear measurements by drawing lines of different lengths and indicating verbally the differences.	2. Use an overhead projector and colored grease pencils on a plastic sheet to draw lines of different lengths, cartoons of people of varying heights, and rows of objects of assorted lenths for comparison by the class. The lines and rows of objects can be shortened or lengthened to show how length conditions can be changed.	Foot rule Yardstick Pieces of string Pieces of rope	
3. To be able to find the longest or shortest of an assortment of objects by holding it up for the class to see.			

4. To be capable of selecting from a line of people the tallest and shortest person.

5. To pick the longest or shortest of lines of people, rows of chairs, or stacks of books.

6. To conceptualize distance differences by comparing verbally the distances between familiar places.

3. Distribute lengths of shoestring licorice candy to the class and encourage them to start eating it. After a few minutes have each of them hold up their pieces to compare for length.

4. Place a box of assorted objects on a table and seat the children around it. The box could contain tongue depressers, pencils, string, strips of cloth, etc. Ask the class to pick out the longest (or shortest) of all the objects. Then ask them to indicate the longest or shortest in each category.

5. Instruct the class to determine the longest or shortest in lines of people, (what class has the longest lunch line?), rows of chairs or desks, rows of objects (marbles, blocks, etc).

6. Encourage the class to guess who the tallest and shortest class member is and then check on their answers.

7. Have class arrange themselves in a row, tallest to shortest.

8. Involve the class in a discussion of distances. Try to elicit responses that will give a basis for comparison of great distance within the child's experience, e.g., It is farther from here to our homes than it is from here to the playground.

Lengths of material

Class members

Overhead projector

Grease pencil

Plastic sheet

Lines of people

Rows of desks

Shoestring licorice candy

LESSON #5

SCOPE OF THE LESSON: Establish an awareness of weight differences and how they are used.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be capable of verbalizing differences in the weight of objects.	1. Offer an assortment of objects for examination that have obvious weight differences such as a brick, an empty milk carton, a sheet of paper, etc. Encourage the children to handle them and describe them as being heavy or light.	Block of balsa Block of lignum vitae (or lead)	We know things can be long or short. They can also be big or small. Now we know about heavy and light.
2. To determine by visual discrimination the probable weight differences of objects.	2. Use the projector to show pictures of paired objects and have the pupils determine the relative weight differences.	Empty milk carton	Sometimes big things are heavier than little things.
3. To conceptualize weight differences of verbally described objects by stating the probable differences.	3. Demonstrate that small objects may be heavy and large ones light by using a large block of bolsa and small block of lignum vitae (or lead) and a small sack of lead shot and a feather pillow.	Empty coffee can Quantity of dry corn kernels (or wood beads)	Sometimes little things are heavier. A scale helps us to know what is heavy and what is light.
4. To determine weight differences by correctly using a simple balance scale.	4. Put a weight equal to the average weight of pupils in the class on one end of a seesaw. Note: this weight can be adjusted by using small sandbags often available from the P.E. Dept. Let each child sit on the other end of the seesaw to see if they are lighter, equal to, or less than the weight.	Overhead projector or opaque projector	
5. To be able to find the heaviest (or lightest) in an assortment of objects by using a spring or balance scale.	5. Make a balance scale from a wood dowel, some string and two coffee can tops. With the scale compare weights of different articles.	Pictures of light and heavy objects in pairs (toy truck and big truck, baby and man, minnow and whale, etc.	

Note: There is no concern about pound measurements.	6. Do the same exercise with a spring scale noting only that larger numbers mean heavier things. Do not be concerned with reading pounds or fractions of pounds.	Balance scales (can be home-made Spring scales Bag of feathers Sack of lead shot Seesaw	

LESSON #6

SCOPE OF THE LESSON: Develop the ability to discriminate between a penny, a nickel, and a dime and have a general knowledge of the relative values and purchasing power of these coins.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be able to identify by name the penny, nickel and dime coins.	Note: In all activities involving money real coins should be used. Play money is not real therefore it becomes an abstraction and loses its effectiveness as a teaching aid.	Pennies Nickels	Money is nice to have because it buys things.
2. To show an understanding of the relative value of the penny, nickel and dime by matching combinations of coins of equal value.	1. Seat the children around a table and distribute pennies, nickels, and dimes. Discuss the coins and determine whether students know the names of the coins and can visually discriminate their differences.	Dimes Bubble gum machine Empty ½ pt. milk cartons	Money is not all the same. There are: pennies nickels dimes
	2. Demonstrate that 5 pennies and a nickel (5¢ piece) are of equal value. Do likewise with two nickels, ten pennies, and a nickel and five pennies being equal in	Mock-up of a parking meter	

3. To demonstrate an understanding of the value of these three coins by naming examples of how they may be used. 4. To exhibit an interest in the purchasing power of money within a ten cent limit by spending within these limits in a class store.	value to a dime (10¢ piece). 3. Discuss what can be paid for with these coins singly or in value up to and including ten cents. Examples might be: candy bubble gum soft drinks shoe laces phone call lunch milk pencil crayons paper Cracker Jack 4. Use a class store activity in which real articles are purchased with real money. Children can take turns being storekeeper. 5. A gum machine to take pennies might be obtained from the Elks or a candy distributor. A mock-up of a parking meter and a play or real pay phone would demonstrate the use of dimes and nickels.	Mock-up of a pay telephone Note: A real one may be available from the local phone company. Assorted items with values from a cent to ten cents. Cash register	We know that the nickel will buy more than a penny and a dime buys more than a nickel. We also know we can use 5 pennies for a nickel or 10 pennies for a dime. We can use 2 nickels for a dime too.

LESSON #7

SCOPE OF THE LESSON: Alert pupils to the existence of quantity relationships.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be able to verbalize quantity relationships as they apply to:	1. Discuss with the class the numbers of body parts, i.e., fingers, arms, eyes, etc. Involve in the discussion such words as "more" fingers than thumbs, "fewer" eyes than fingers, "as many" fingers as toes, etc.	Class members Marbles or beads	We know that all things are not always the same size.
(a) body parts (b) numbers of objects	2. Count objects (up to 10) and demonstrate that the candy in a bag of M & M's is more than one or two.	Play blocks of assorted sizes	We have big things. Some are larger and others are smaller.
(c) the size of objects (d) the location or position of objects	3. Focus attention on the use of larger and smaller as quantity designations. Relate this to any variety of objects such as children and parents, toy cars and real ones, a watermelon seed and a watermelon, etc. Blow balloons to different sizes or gradually let the air out and ask, "Is this larger or smaller than before?"	Balloons The classroom furniture displacement	Some are about the same. We have words like many, few, lots, not many, some. They all mean that there are differences in size or number.
(e) the whole and its parts	4. The words "more than", "less than", the "same as" should be used as quantity representations and can be illustrated in numerous ways. For example, it might be said of the class that there are more boys than girls, or there are more chairs than tables, or more red books than blue books, etc.	Pennies Nickels Dimes	
	5. To illustrate that the whole is the sum of its parts and that this is related to quantity the teacher could have the pupils equate the number of pennies that make a nickel and so on. Geometric models of squares, circles, and cubes could be taken apart.	Geometric models that are divided into parts	

LESSON #8

SCOPE OF THE LESSON: Acquaint children with some reasons for temperature differences.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To participate in a discussion of temperature differences.	1. Use an opaque projector to stimulate interest in temperature differences by showing amusing or interesting pictures of areas of the world where there are temperature extremes. Also show a sequence of seasonal changes in a temperate area.	Thermometer Opaque projector Pictures of:	We have seen that people live in many places. Some places are hot, some are cold, some change with the seasons.
2. To take part in a temperature experiment by: reading the thermometer, recording readings, helping in an experiment, etc.	2. With the above, superimpose a drawing of a thermometer showing the red line, high for hot areas, low for cold, etc. 3. Discuss clothing and weather and temperature. Show with ice cubes and gloves the function of clothing and temperature. Do the same with a hot jar of water. 4. Make a small model of a house from sheets of styrofoam and use it to show how houses protect us from weather by placing in the house an ice cube and subjecting it to heat and a hot jar of water and placing it in a cold place.	Tropics Artic regions Temperate regions Desert Glaciated mountains	It is not nice to be too hot or too cold. Houses and clothing help us be more comfortable. A thermometer tells us if it is hot or cold.
3. To demonstrate an understanding of temperature differences by verbally describing the terms hot, cold, warm, etc.	5. Develop a bulletin board on temperature, weather, and related activities.	Winter clothing Summer clothing Seasonal sports Houses Ice cubes Heating pad Hot water	

LESSON #9

SCOPE OF THE LESSON: Develop an awareness of rhythm as an aid in counting.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To react to rhythm by participating in marching and rhythm activities. 2. To actively count in time with the rhythm exercises. 3. To assume a turn in leadership in the rhythm counting exercises.	1. Engage the children in a variety of marching exercises interspersed with rhythm games and instruments. 2. Introduce counting up to 10 as part of the above. 3. Allow the children to take turns in acting the part of the leader. 4. Also have students jump rope and count as they jump.	Rhythm band instruments Marching records Record player Jump ropes Rhythm rhymes and songs, i.e., One, Two, Button My Shoe, Ten Little Indians, etc.	It is fun to march. It is fun to sing. We can count as we march. We can sing as we count.

LESSON #10

SCOPE OF THE LESSON: Emphasize the concept of spatial relationships

Instructional Objectives	Activities	Resource Materials	Experience Charts
1. To participate in games and activities which emphasize spatial relationships	1. Involve the class in activities, games and songs which utilize body movements and a vocabulary emphasizing spatial relationships. 2. Encourage the use of words such as up, down,	Itsy Bitsy Spider Bluebird Bluebird	We have words to tell where things are, or where we are.

2. To be capable of using words which express spatial relationships.	in, beside, etc., in class discussions. Point out the frequent use of these words.	Mulberry Bush	We can be:
3. To exhibit an understanding of words which denote spatial relationships by using them in conversation and by successfully following directions given in these terms.	3. Use the words denoting spatial relationships in giving directions to the children in mass or individual situations, i.e., "Pur your head on your arms." "Raise your hands over your heads." "Put the books in the desk."	Record player Records	up down in out
	4. Through questioning and the observed use of words which denote spatial relationships determine the competency of each child in using this vocabulary.		beside behind before below under ahead

TIME

STARTER UNIT TOPIC

FOR

INTERMEDIATE LEVEL

EDUCABLE MENTALLY RETARDED

UNIT TOPIC: TIME

I. RATIONALE

The ability to handle the concept of time is crucial to the adjustment of all children, whether normal or retarded. The affairs of the entire community are regulated and to some degree controlled by time schedules.

Because of the retarded child's inability to spontaneously grasp the abstract concept of time, he often meets with difficulties at home, school and in the community. Therefore a unit designed to teach the concept of time in a concrete and meaningful manner should be indispensible in contributing to the total adjustment of the retarded child.

II. SUB-UNITS

A. Plants
B. Farms
C. Transportation
D. Recreation
E. Weather
F. Money
G. Music
H. Science
I. Jobs
J. Measurement
K. Budgeting

III. OBJECTIVES

A. To develop the different concepts of time through knowledge of seasons, the calendar, time zones and daily time.

B. To develop an understanding of earlier methods of telling time and how they might relate to the students' everyday lives.

C. To develop the ability to tell time in hour and half hour intervals and to relate this ability to the functions of everyday life.

D. To develop an understanding of elementary scientific phenomena that account for seasons, day and night, minutes, hours, etc.

E. To develop time concepts in general terms (i.e., early, late, now, then, earlier, later, etc.).

F. To identify various consequences related to time. For example:

   1. What might happen if we're late for school?
   2. Will going to bed early give me more energy for working and playing?
   3. Would a two hour walk make me tired?
   4. What happens when we're late for the bus?

IV. CORE AREA ACTIVITIES

A. Arithmetic Activities

   1. Read time tables for city busses, trains, etc.
   2. Make a calendar for the month--construct individually as well as a group project for bulletin board.
   3. Construct a demonstration clock for the bulletin board.
   4. Make a season wheel.
   5. Relate times given various locations on a demonstration clock using number concepts of 1 and ½.
   6. Count the number of days, weeks, months before or after important dates.

B. Social Competency Activities

1. List some problems resulting from being late for school, work, etc.
2. Role play a situation that might occur when tardy for a class, work, or a date.
3. Work as a group to construct bulletin boards to illustrate holidays.
4. Clap hands to keep time with a metronome.
5. Do simple rhythm steps in time with a metronome.
6. Participate in elementary group dances that require some sense of rhythm to execute.

C. Communication Skills Activities

1. Read the day, month, and year on newspapers, magazines, books, etc.
2. Obtain schedules of the departure and arrival of postal pickups at the post office.
3. Obtain timetables from the bus depots.
4. Make out time schedules for daily activities.
5. Write invitations to another class to attend a class function at a certain time and date.
6. Write friendly letters indicating the date and time of the letter as well as the date and time of certain events that have occurred.
7. Role play making arrangements with a friend to go to a movie--time, date, place, etc.

D. Safety Activities

1. Call the local hospital to determine the times that doctors are on duty.
2. Demonstrate safety precautions to be taken related to seasonal sports.
3. Figure starting times for trips so that destinations may be reached without careless hurrying.

4. Role play possible accidents that might occur as the result of hurrying because of tardiness.
5. Call hospital to determine the regular hours as well as emergency hours that are followed.

E. Health Activities

1. Plan different menus to correspond to the various holidays and seasons.
2. Read to determine the amount of sleep needed by the body nightly.
3. List the detrimental effects of eating too rapidly.
4. Construct and discuss a bulletin board of appropriate clothing for various occasions, time of the day, and season of the year.
5. Demonstrate the length of time to leave thermometer in the mouth.
6. Take the pulse and respiration of a classmate using a stop watch.
7. Watch a film related to the timing of artificial respiration.

F. Vocational Competency Activities

1. Interview local businesses and factories to determine the working hours.
2. Visit a larger business that utilizes a time clock--have the manager demonstrate and explain its function.
3. Investigate the number of hours various community workers spend on the job (policemen, grocer, teacher, truck driver, doctor, etc.).
4. Compute a simple hypothetical wage for a worker who works a set number of hours for a certain rate. Emphasize that time may indeed be equivalent to money.

V. RESOURCE MATERIALS

Newspapers

Books and magazines

Calendars

TV and TV Guide

Thermometers

Barometer

Clocks and Watches
(regular and stop)

Metronome

Model of our solar system

Pictures of clocks, sun dials

Hourglasses

Bulletin boards and materials

Films and film strips

Projectors

Overhead projector

Resource people:

Fireman

Policeman

Bus depot attendants

Telegraph office operator

Doctors or interns

Grocer

FILMS

(From University of Iowa Catalog of Educational Films, 1966-69)

Ordering address:
Audiovisual Center
Division of Extension and
University Services
University of Iowa
Iowa City, Iowa 52240

The following films are included as possible helps in teaching the unit. They are only suggestions from which the teacher may choose, depending on the nature and interests of her particular class.

1.	The Calendar: Story of its Development	U-5066
2.	The Story of Measuring Time: Hours, Minutes, Seconds	U-6037
3.	The Calendar: Days, Weeks, Months (Primary)	U-4024
4.	Children of Switzerland (Primary-High School)	U-776

5. The Clock in the Sky (Elementary-Junior High)	UK-3937
6. How to Measure Time (Intermediate-Junior High)	U-5684
7. What Time is It? (Primary-College)	U-3346
8. Our Big Round World	U-3727

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Carona, P. B. *Things that measure*. Englewood Cliffs, New York: Prentice-Hall, Inc., 1962.

Corvan, H. J. *Time and its measurement*. New York: The World Publishing Company, 1958.

Harrison, L. C. *Sun, earth, time, and man*. Chicago: Rank McNally and Company, 1960.

McGinley, P. *Wonderful time*. New York: J. B. Lippincott Company, 1965.

Maloney, T. *The story of clocks*. New York: Sterling Publishing Company, Inc., 1960.

Palmer, B. *Time*. New York: Mayton Publishers, Inc., 1959.

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Waller, L. *A book to begin on time*. New York: Henry Holt and Co., 1969.

VI. VOCABULARY

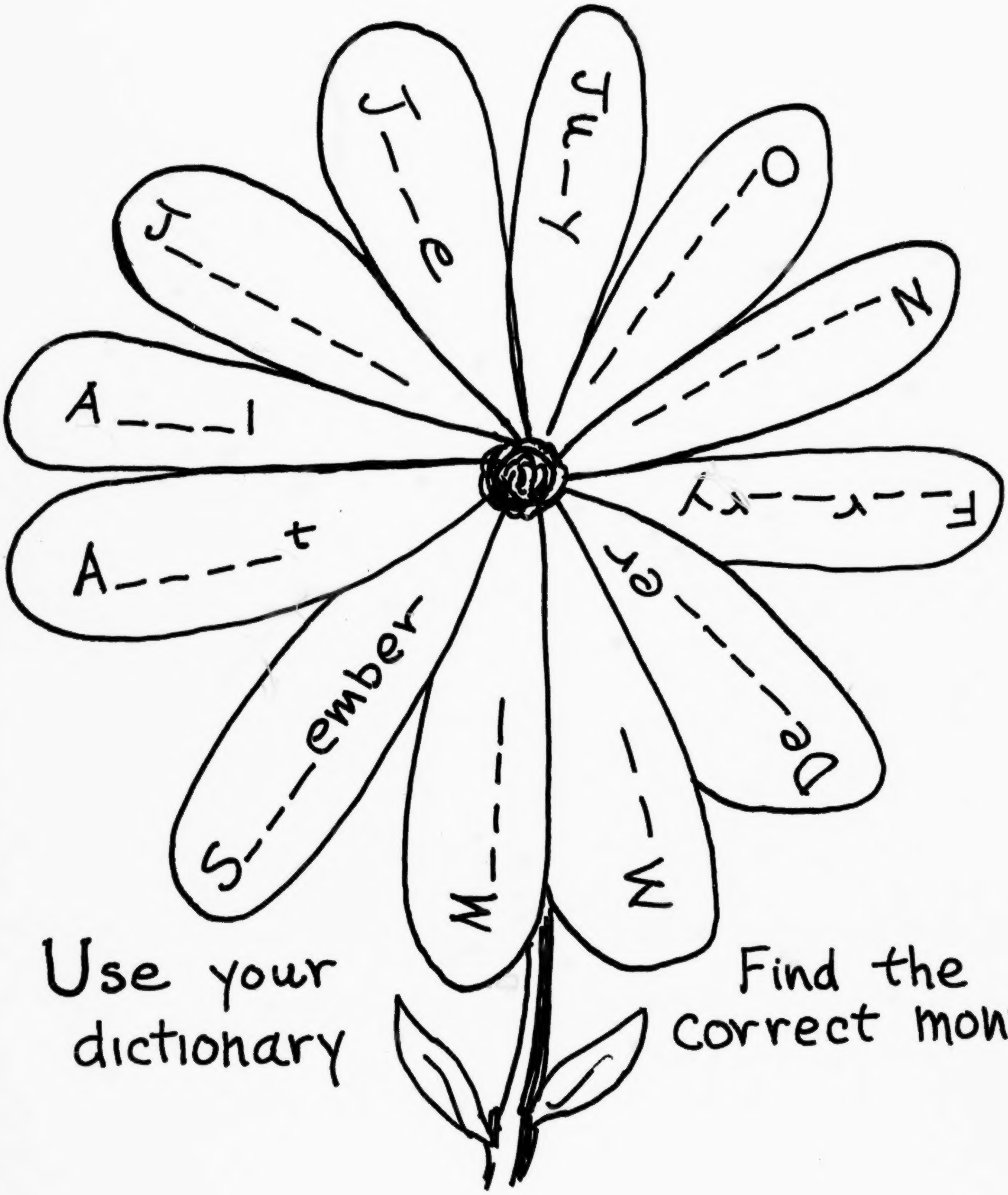
day
week
month
calendar
year
leap year
decade
century
second
minute
hour
early
late
measurement
hourglass
sundial

metronome
time clock
half hour
quarter hour
a.m.
p.m.
morning
night
afternoon
evening
: (colon)
o'clock
noon
today
tomorrow
now

past
present
future
channel
program
television
yesterday
tomorrow
days of the week
months of the year
holidays
seasons
spring
summer
autumn
fall

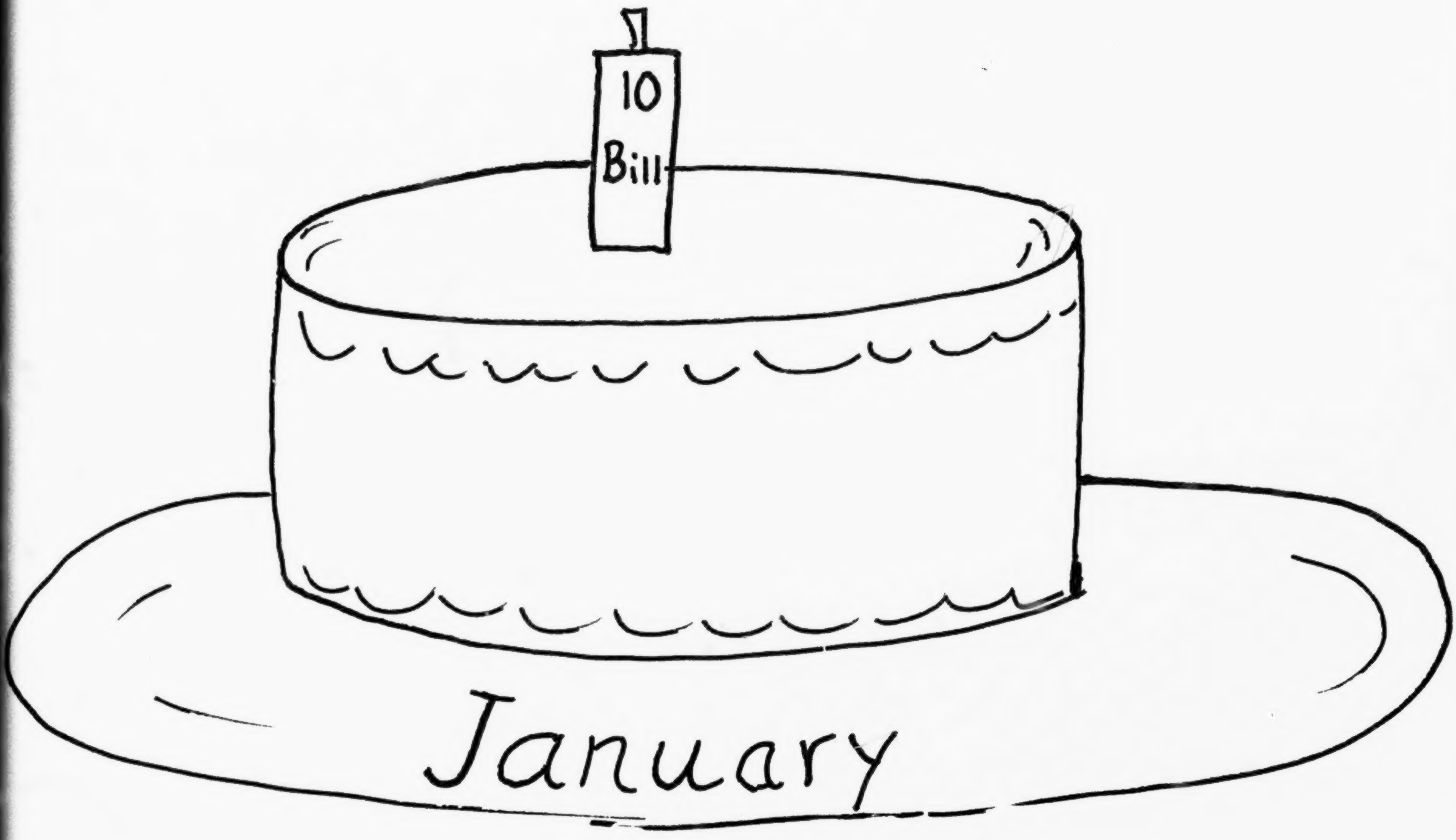
winter
timetable
stop watch
watch
clock
standard time chart
daylight saving time
time zones
solar system
sun
moon
stars
rotation
alarm
set
wind

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 1.			
1. To be able to use and define certain time related terminology when it is presented orally or written. 2. To be able to correctly pronounce the names of the months. 3. To recognize the months in reading. 4. To verbalize a connection between months and time. 5. To be able to cite his birthday.	1. Introduce the conception of time by reading a background story covering past, present, future, what makes a year and months. 2. Prepare 12 large cardboard and construction paper cakes, each representing one of the months. Label each cake and ask the children to read the word under each cake. Point to the first one to insure that they read and learn the names of the months in sequential order. Read the name of each month together as a group. 3. Have the children make oaktag candles using a pre-cut pattern and write their names on the candles. Have each child recite his birthday and place the candle on the proper birthday cake with a pin. If the child doesn't know his birthday, tell him and then have him pin his candle on the proper cake. Seatwork: Students copy experience chart to put in a Time notebook. Pupils can either refer to the cakes or use a dictionary to fill in the blanks of the worksheet. Outline the picture with colors they choose. Enclose for their notebooks. Vocabulary: past, present, future, year, birthday, month.	The First Book of Time. Jeanne Benstick, Franklin Watts, Inc., N. Y., 1963. pp. 6-18, pp. 36-41. Cakes made out of oaktag. Candles of oaktag. Straight pins 24" x 30" rules newsprint for chart. Magic markers 9" x 12" ruled newsprint Pencils Duplicated worksheet Dictionaries Crayons	What Is Time? The past is what has happened. The present is now. The future is all time to come. There are twelve months in a year. My birthday is ________________.


J _ _ e
Ju _ y
O _ _ _ _ _ _
N _ _ _ _ _ _ _
F _ _ r _ _ ry
De _ _ _ _ er
M _ _
M _ _ _ _
S _ _ _ ember
A _ _ _ _ t
A _ _ _ l
J _ _ _ _ _ _

Use your
dictionary

Find the
correct month


10
Bill
January

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 2			
1. To be able to use a calendar to locate the week, day and month desired. 2. To be able to list the information given by the calendar. 3. List the information on the calendar that changes from month to month. 4. To be able to verbalize the number of days in a week. 5. To be able to verbalize the number of months in a year.	1. Read the pages listed out of Time and The First Book of Time. 2. Discuss the different information that a calendar imparts. Point out the changes which occur monthly. Demonstrate by changing the month, how the different dates will come on different days 3. Write an experience chart. Read orally. Seatwork: Students copy experience chart for Time notebook. Make a picture suitable for the month. Fill in the blanks on the worksheet. Ask the children to take it home to help them use the calendar in their daily lives. Vocabulary: calendar, yesterday, today, tomorrow.	Time, William Hutchinson, Mayton Publishers, Inc., New York, 1959. p. 11. The First Book of Time, Jeanne Bendick, Franklin Watts, Inc., New York, 1963. pp. 36-41. Milton Bradley calendar 24" x 30" ruled newsprint for chart. Magic marker 9" x 12" ruled newsprint Pencils Duplicated worksheet Crayons	The Calendar The calendar tells us the year, the month, and the day. Seven days are in a week. February has 28 days; other months have 30 or 31 days. There are 12 months in a year.
LESSON 3			
1. To be able to name the seasons.	1. Show the film "Seasons of the Year" which answers some of the basic questions concerning the seasons. It tells why it is hot in summer, cold in winter, and what causes the seasons to	Film: "Seasons of the Year": AV Center, Cedar Rapids, Iowa Screen	Seasons of the Year The earth goes around the sun. This path is called an "orbit." When the earth is

Week-Month

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

Worksheet Sample
from Special Education Materials
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The Continental Press, Inc.
Elizabethtown, Penn.

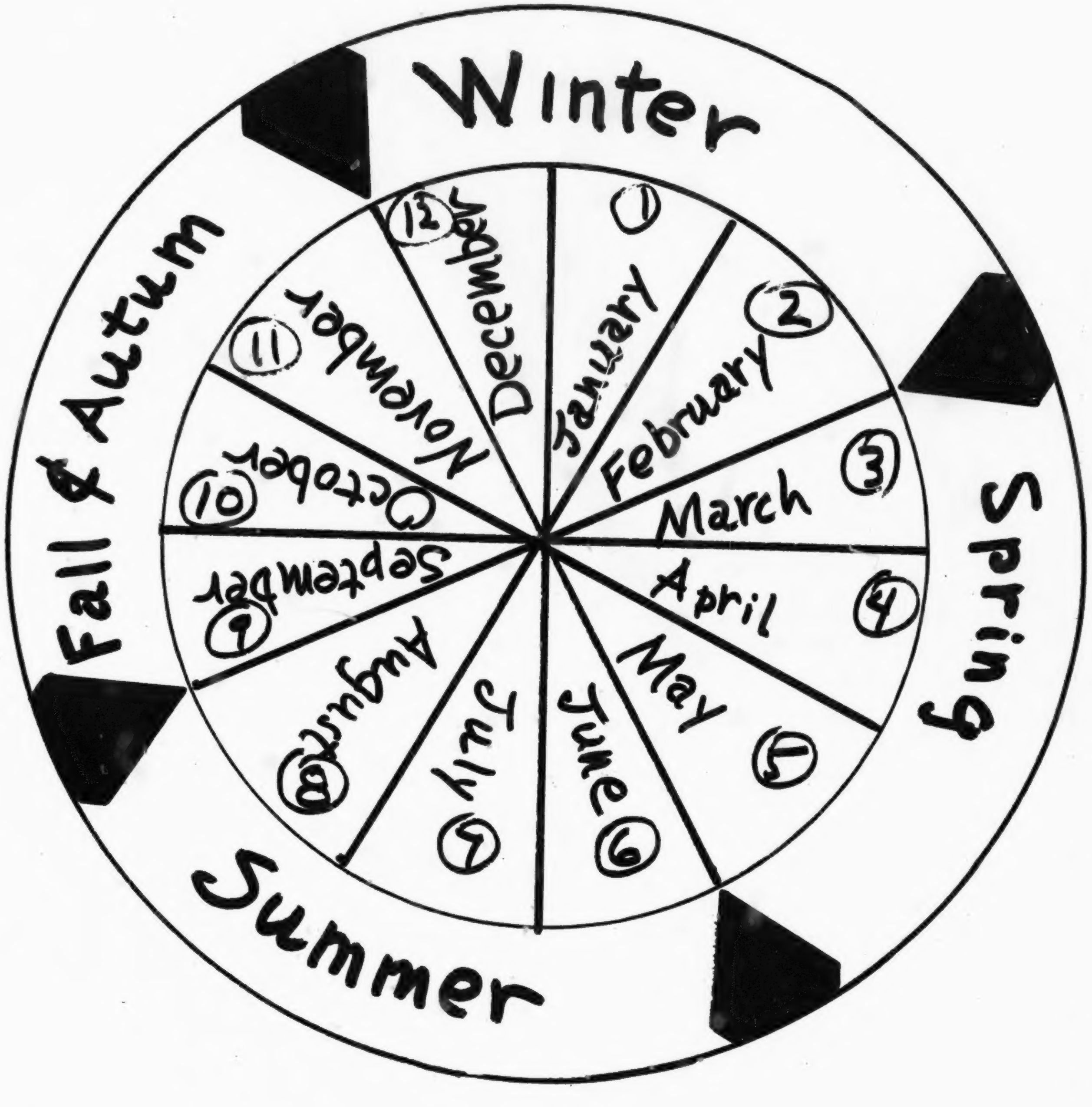
Complete th[illegible]alendar for this month.
Draw or find a picture to show this month.
Write the names of the following:

Yesterday ______________
Tomorrow ______________
Last Month ______________
Next Month ______________

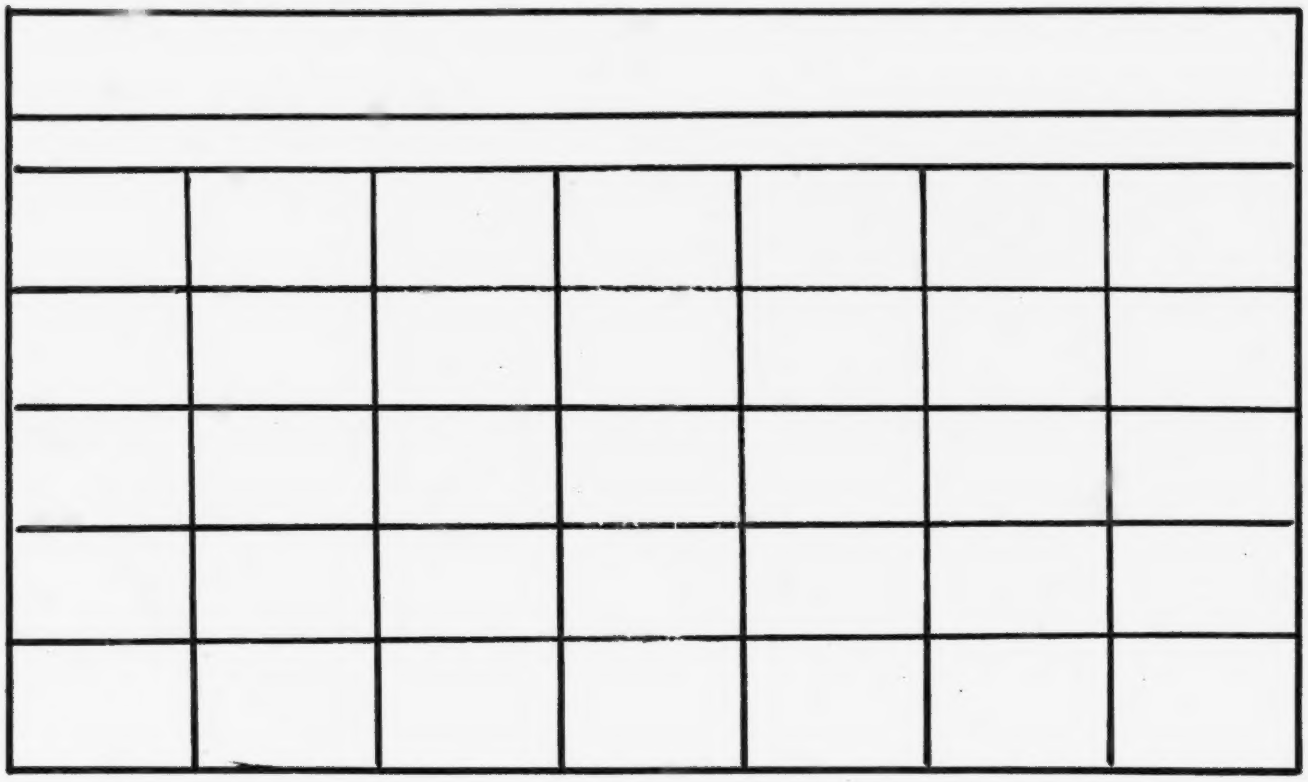
Complete:

There are _____ days in a week.
There are _____ days in a month.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
Lesson 3 (Cont.)			
2. To be able to explain how the seasons occur.	change. It tells why summer days are longer than winter days.	Projector	closer to the sun it is hot. It is cold when the earth is farther from the sun.
	2. Write experience chart and read orally.	24" x 30" ruled newsprint for chart.	
3. To be able to list ways the seasons differ in terms of temperature, months and activities.	3. Hand out season wheel in duplicated form. Review the months of the year, the number, and what months are in what season. Keep and file this in their notebooks. Seatwork: Students copy the experience chart for notebook. Fill in the calendar by using the Milton Bradley one for a model. Fill in the blanks and color the pictures if they wish. Vocabulary: seasons, winter, spring, summer, fall, autumn.	Magic markers Duplicated season wheel 9" x 12" ruled newsprint Pencils Duplicated worksheet on calendar Duplicated sheet on months and holidays Crayons	
LESSON 4			
1. To be able to name and locate the different time zones given a map of the United States.	1. Review previous lessons by passing out duplicated sheets and doing them as a group. File in notebooks. 2. Read Time pp. 1-6. Discuss it further by giving out a duplicated sheet which explains it visually. This is also read orally and the paper filed then in the notebooks.	Time, William M. Hutchinson, Mayton Publishers, Inc., New York, 1959. pp. 1-6 Wonderful Time, Phyllis McGinley, J. B. Lippincott Company, New York, 1965. p. 35.	Daylight Saving Time In spring when maple buds are red, We turn the clock an hour ahead. Which means each April that arrives, We lose an hour out of our lives.

Winter
Spring
Summer
Fall & Autum
January ①
February ②
March ③
April ④
May ⑤
June ⑥
July ⑦
August ⑧
September ⑨
October ⑩
November ⑪
December ⑫

THE CALENDAR



Make a calendar.

Make Sunday the first day of this month.

Make Tuesday the last day of this month.

How many days are there in this month you have made?_______

How many months in any real year have the same number of days as your month?_______

What is the most number of days there can be in any one month?________

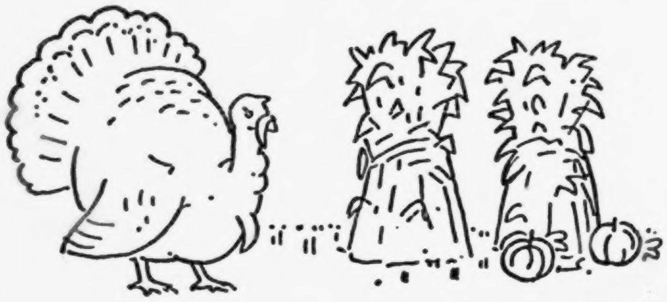
What is the least number of days there can be in any one month?_______

In this month you have made what date is:

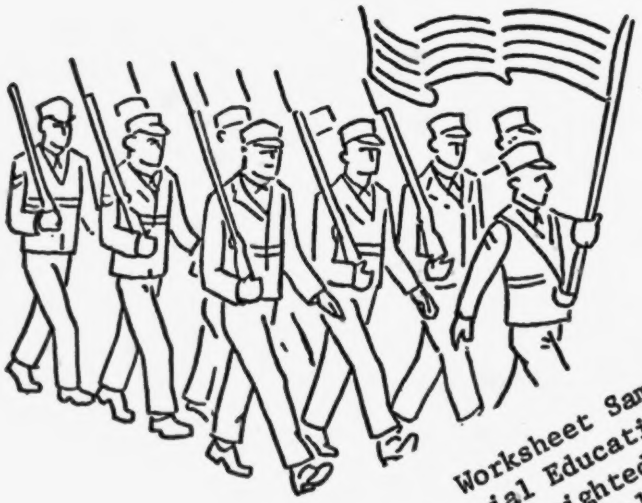
(a) The second Sunday?__________ (c) The third Tuesday?_______

(b) The last Wednesday?_________ (d) The first Friday? _______

Week - Month - Year



This is the month in which we celebrate Thanksgiving. It is the month of ______________.



Worksheet Sample
from Special Education Materials
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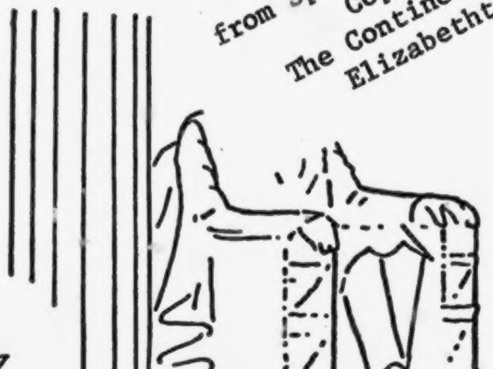
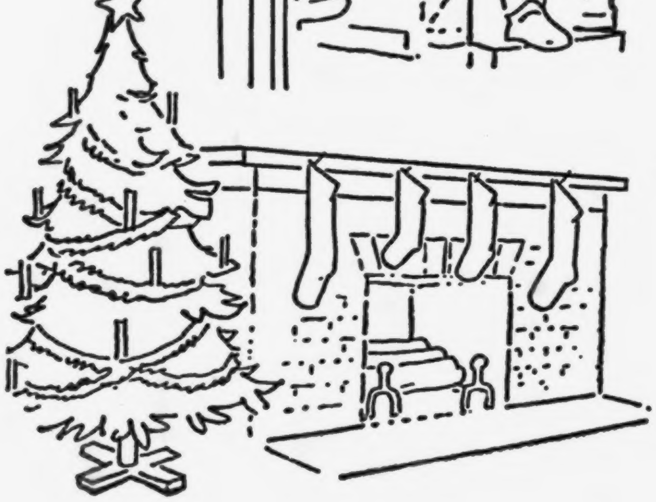
Elizabethtown, Penn.

This is the month in [illegible] we celebrate our 's birthday. It is month of __________.



This is the birthday month of two great Americans. They are ________ and ______________. It is the month of __________.



Christmas Day is on ______ ______. It is the ______ month of the year.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
Lesson 4 (Cont.)			
2. To be able to name and list four reasons for having daylight savings time.	3. Read The Clock We Live On, pp. 49-50. 4. Read and discuss experience chart. Duplicated copies of it are handed out to be put in the notebooks. 5. Point out that daylight savings time allows us more time of day in sunlight. It doesn't change the number of hours in a day--it only rearranges them. Discuss ways that daylight savings time might be helpful to us. Vocabulary: Central Standard Time Daylight Savings Time	The Clock We Live On Issac Asimov, Abelard-Schumann, London, 1965 pp. 49-52 (Daylight Savings Time) Duplicated worksheets Pencils 25" x 30" ruled newsprint for chart	Who cares? When autumn birds in flocks Fly southward, back we turn the clocks And so regain a lovely thing-- That missing hour we lost last spring. (This would be written before class)
LESSON 5			
1. List various ways of telling time (at least three). 2. Name two limitations of each of the ancient time-telling techniques discussed in the film.	1. Read Clocks Tell the Time aloud to the class. 2. Demonstrate, discuss and let each child examine the sun dial, a candle clock, sandglass, water clock, cuckoo clock, a bell. (The first four were made by the instructor according to directions given in books listed in resource materials.) 3. After examining the models, view the film depicting the history of telling time. Discuss the film in light of the models and our present world.	Clocks Tell the Time Dick, Alma Kehoe, Charles Scribners Sons, New York, 1966. Film: The Story of Measuring Time: Hours, Minutes, Seconds. U-6037. Time and Its Measurement, Harrison J. Corvan, The World Publishers, New York, 1958. p. 149, 150.	Telling Time Long Ago The shadow-caster was used first. The sun-dial was next. When it was dark you could not tell time. The water clock was better. We still use sand glasses.

Review

Put the correct season in each blank.

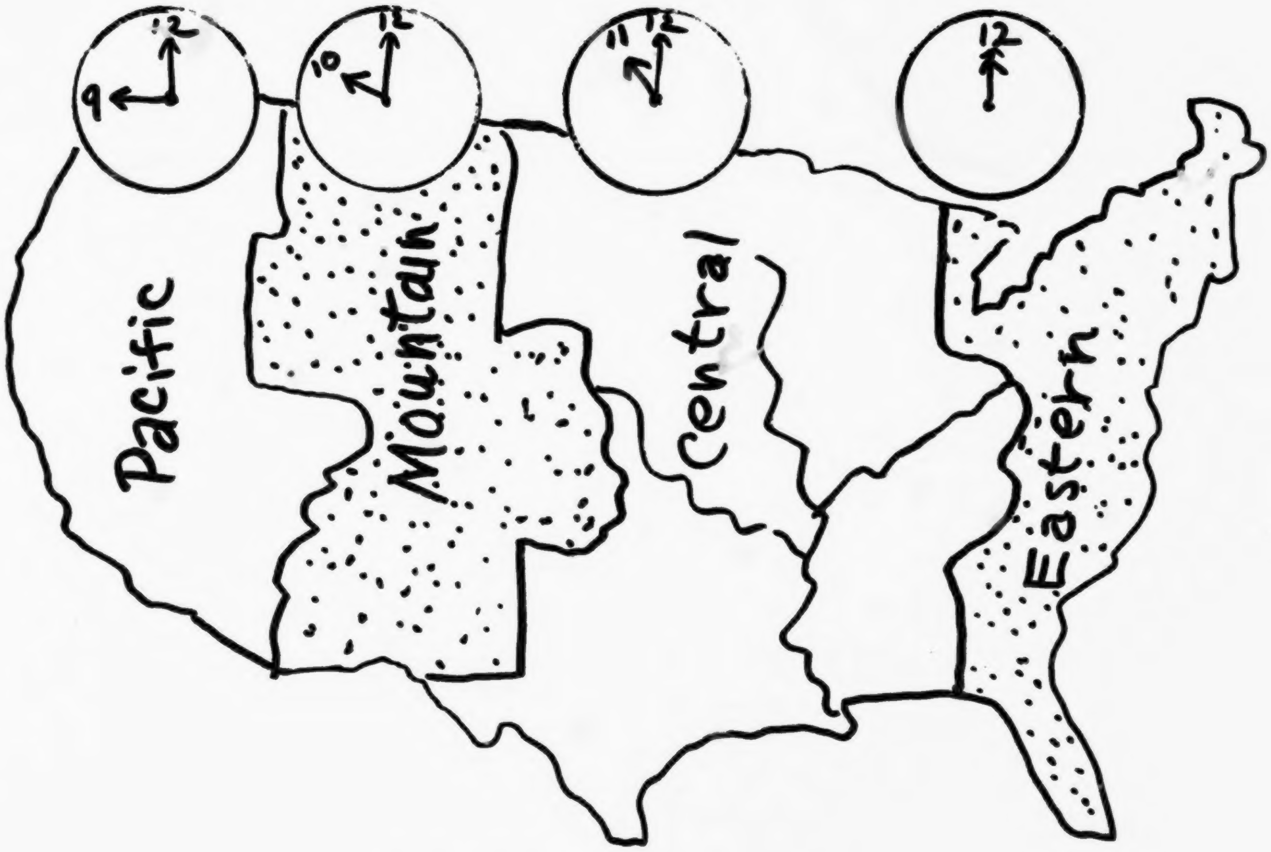
1. School begins in the ________________.
2. Christmas comes in the ________________.
3. Easter is in the __________________.
4. The Fourth of July is in the______________.
5. You play in the snow in the __________.
6. In the _____________________it is hot.

Draw a line between opposites.

Winter	First
Past	Tomorrow
Yesterday	Spring
Autumn	Summer
Last	Future

Put the months in the correct season.

winter	spring	summer	fall



TIME ZONES in the UNITED STATES

The United States is divided into four time zones. Each is one hour different from the next. The zones are not divided by straight lines.

The chart at the top of the page shows the time zones. Each zone has a different clock. When it is twelve o'clock in the Eastern Zone, it is ten o'clock in the Mountain Zone. When it is eleven o'clock in the Central Zone, it is nine o'clock in the Pacific Zone.

Iowa is in the Central Zone.

In this country people living along the Atlantic Ocean are the first to see daylight. As the earth turns, the people in the middle states are next to see the light. The people in the Mountain Zone receive light from the sun next. The people living along the Pacific Coast are the last to see the sun in the morning.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
Lesson 5 (Cont.) 3. Demonstrate the ability to correlate time with music by tapping pencil or foot to a record or vocal piece of music.	4. Hand out duplicated papers with pictures of the various ways of telling time. Relate pictures to the objects observed. 5. Using a music chart and words on a paper, learn the first verse of "The Cuck-Coo Clock." 6. Write an experience chart. Read aloud. Seatwork: Copy the experience chart for notebook. Fill in the blanks on the worksheet. Vocabulary: sand glass or hour glass sundial, water clock, candle clock, verse, measurement	A Basis for Primary Mathematics, P. K. Chivers, Ward Luck Educational Company, Ltd., London. pp. 50-52. "The Cuck-Coo Clock" Mena C. Pfirshing, Clayton F. Summy Co. London, 1963.	
LESSON 6 1. To be able to demonstrate on the blackboard why there is a day and night. 2. To be able to explain why time differences exist in different lands.	1. Show the film strip "Finding Out About Night and Day". This film strip explains in simple terms why we have night and day, why the moon shines, why the moon's shape changes. It tells what the sun is. It simply describes the work of astronomers. 2. Hand out the poem "Why We Have Night and Day" and "Four Seasons". Read orally. Put in notebook.	Film strip "Finding Out About Night and Day"--AV Center, Cedar Rapids. Screen, projector Time, Leslie Waller, Henry Holt & Company, New York. 1959	Day and Night As the earth spins, different countries face the sun. When a country faces the sun, it is day. When a country does not face the sun, it is night.

THE CUCK-COO CLOCK

On the wall hangs a brown wooden clock,
   Saying tick! tock! tick! tock!
"Twas carv'd from a tree in fair Germanie,
   Tick! tock! tick! tock!

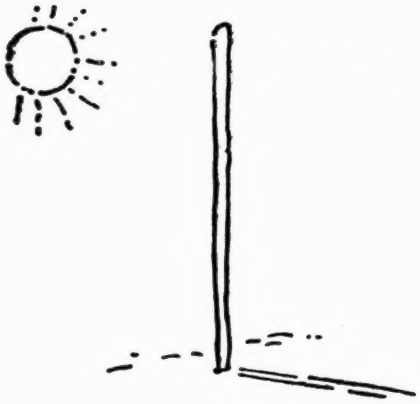
In its heart lives a pretty bird blue, Cuck-Coo!
   Tho' made of pine wood, It's almost as good
As a wonderful, real and true Cuck-Coo!
   Cuck-Coo! Cuck-Coo! Cuck-Coo!

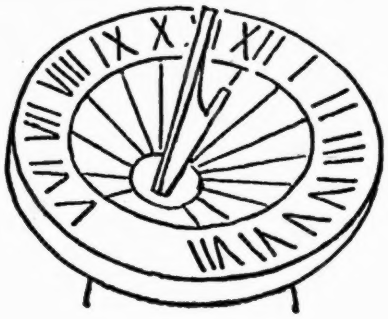
See a little red door at the top, flip flop!
   Out flies the bird blue to sing just for you,
Cuck-Coo! Cuck-Coo! Cuck-Coo! Cuck-Coo
   Cuck-Coo! Cuck-Coo! Cuck-Coo!

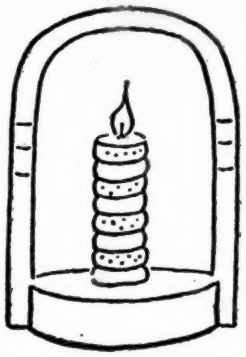
Mena C. Pfirshing

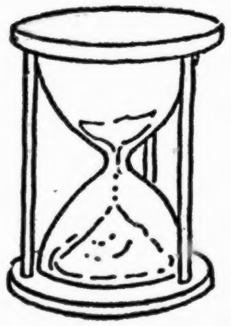
Telling Time Long Ago

Write the name of each picture beneath the picture.









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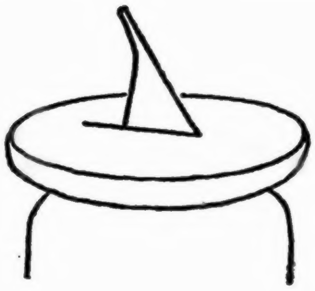
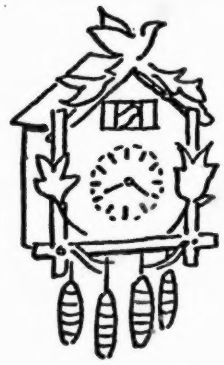
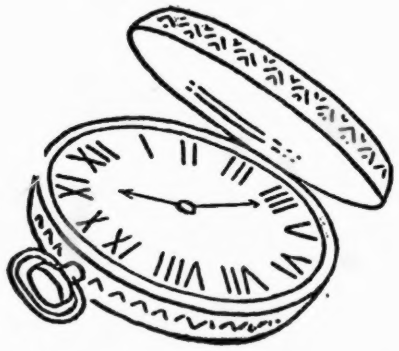
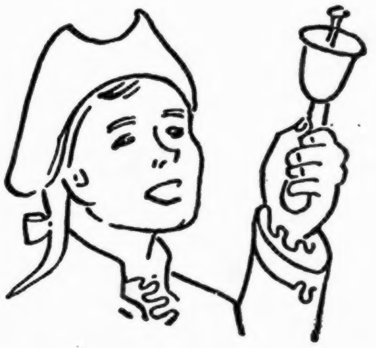








Time-telling instruments are more accurate today than long ago.

It is ______ o'clock by the classroom clock.

Today is______________, ____________ ____, 19____.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
Lesson 6 (Cont.)			
3. To express activities and feelings related to day and night through art work.	3. Review the first verse of "The Cuck-coo Clock". Learn the second verse. 4. Write an experience chart. Read orally. Hand out duplicated copies for their notebook on Time. Seatwork: If the children can read well enough let them complete the review independently. If not, read it as a group. Give each child a piece of oaktag, 9" x 11". A piece of navy construction paper will cover half. A piece of white construction paper will cover the other half. The children create pictures showing the contrast of night and day. This can continue into art period in order to complete it. Vocabulary: day, night, twenty-four hours	Wonderful Time, Phyllis McGinley, J. E. Lippincott, Philadelphia. 1966. Song, "The Cuck-Coo Clock" Chart paper Magic markers Duplicated copies of experience charts Duplicated work sheet 9" x 11" oaktag Navy construction paper White construction paper Crayons Pencils	Every place has a new day every twenty-four hours.

Review

Put an X on the correct answer.

1. Years ago man told time by shadows, water clocks and candle clocks . . . . Yes No

2. They used these because they didn't know any better. . . . Yes No

3. You could tell time by the shadow stick and sundial when it rained or at night. . . . . Yes No

4. There are 12 months in the year. . . . . Yes No

5. Calendars tell how old it is . . . . Yes No

6. There are four time zones in the United States . . . . . . Yes No

7. "Daylight Savings" time is used in the summer . . . . . . Yes No

8. It is night at the same place everywhere . . . . Yes No

9. If we want to know the right time we can dial 336-7212 on the phone. . . . . Yes No

10. There are five days in a school week . . . . Yes No

11. You can run as fast in snow as you can where there is no snow . . . . Yes No

12. You get as cold in summer as you do in winter. . . . . . . Yes No

Measuring Time

Jimmy was told that school began at 9:00 A.M. School would be out at 2:30 P.M. Jimmy knew that A.M. tells about time after 12 o'clock midnight and before 12 o'clock noon. He knew too that P.M. tells about time after 12 o'clock noon and before 12 o'clock midnight.

He also knew that the colon (:) separates hours from minutes when time is written.

Jimmy knew that he went to school in the morning. He got out of school in the afternoon.

Jimmy gets up at 7:00 ______________.

He watches TV on Saturday morning at 9:30____________.

He goes to bed at 8:30 ______________.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 7			
1. To be able to indicate and name the basic parts of the clock --face, hands, numerals, etc.	1. Read aloud and discuss pp. 42-49 in Things That Measure.	Things That Measure Philip B. Carona, Prentice Hall, Inc., Englewood Cliffs, N. J., 1962. pp. 42-49.	Telling Time We use the clock to tell time by. The big hand tells the minutes. The little hand tells the hours. The second hand is the fastest.
2. To respond to A.M. being the time between midnight and noon.	2. Read and discuss Tell Me The Time, Please. This is a small book which reviews what has been covered plus introducing modern methods of telling time. It ties up everything learned plus providing a bridge and an introduction to the next part of the unit.	Tell Me The Time, Please, Lillian J. Bragdon. J. P. Lippincott Co., New York, 1936.	
3. To respond to P.M. as the time between noon and midnight.	3. Review the first two verses of "The Cuck-Coo Clock." Learn the third.	Duplicated song, "The Cuck-Coo Clock"	
	4. Write an experience chart. Read it orally.	Chart paper	
	Seatwork: Read orally duplicated copy of We Measure Time. Read aloud A Day. Fill the blanks. Review orally the time words. Fill in the blanks individually. Put all papers in notebooks.	Duplicated copies of the chart Duplicated work sheets	
	Vocabulary: Big hand, little hand, second hand, midnight, noon, A.M., P.M.	Pencils	

MEASURING TIME

It takes the hour hand (short hand) one hour to move from one number to the next number. It takes twelve hours for the hour hand to go all the way around the face of the clock. The front of a clock is called the face.

The long hand (minute hand) moves from one number to the next number in five minutes. It moves all the way around the face of the clock in one hour. The little marks around the face of the clock are the minute marks. It takes the minute hand one minute to go from one of these minute marks to the next. There are sixty minutes in one hour. That means that there are sixty minute marks on the face of the clock. The marks next to the numbers are counted as minute marks.

Fill in the blanks in the sentences below using words from this list.

face   long   short   minute   sixty   twelve   hands

1. The front of a clock is called the ____________.
2. The minute hand is the ____________hand.
3. The hour hand is the ____________hand.
4. The ____________go around the face of the clock.
5. The little marks on the face of the clock are called the ____________ marks.
6. It takes one ______________for the long hand to go from one minute mark to the next.
7. It takes one ________________for the short hand to go from one minute mark to the next.
8. There are ____________minutes in one hour.
9. In one hour, the minute hand passes by ____________minute marks.

A.M. and P.M. Make a Day

Many years ago, a day was divided into 24 hours. Any number of hours could have been used to divide the day. It would have made no difference. Now, though, everyone uses the 24-hour day. That means that the hour hand on a clock goes all the way around the face of the clock two times every day. It goes around once from 12 midnight to 12 noon. Then it goes around once again from 12 noon to 12 midnight. The first time around, from 12 midnight to 12 noon, is called the A.M. (for before noon). The second time around, from 12 noon to 12 midnight, is called the P.M. (for after noon).

COMPLETE:

There are ____________ hours in A.M.

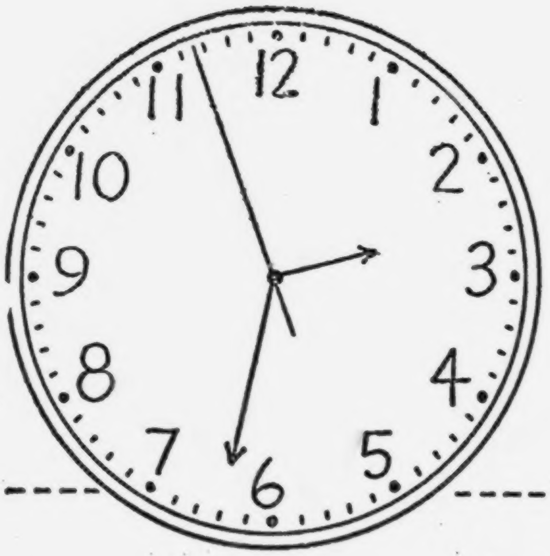
There are ____________ hours in P.M.

There are ____________ hours in a day.

We go to school at 8:00 o'clock ______ ________.

We leave school at 3:00 o'clock ______ ________.

Measuring Time



When we measure time by a clock, we talk about seconds, minutes, and hours. A second is the shortest measure, a minute is the next, and an hour is the longest.

Something to Learn

60 seconds = 1 mi e
60 minutes
24 h

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When we me by a calendar, we ta about days, weeks, months, and years. A day is the shortest measure; a year is the longest.

JANUARY

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Something to Learn

7 days = 1 week
52 weeks = 1 year
12 months = 1 year
365 days = 1 year

Time Words

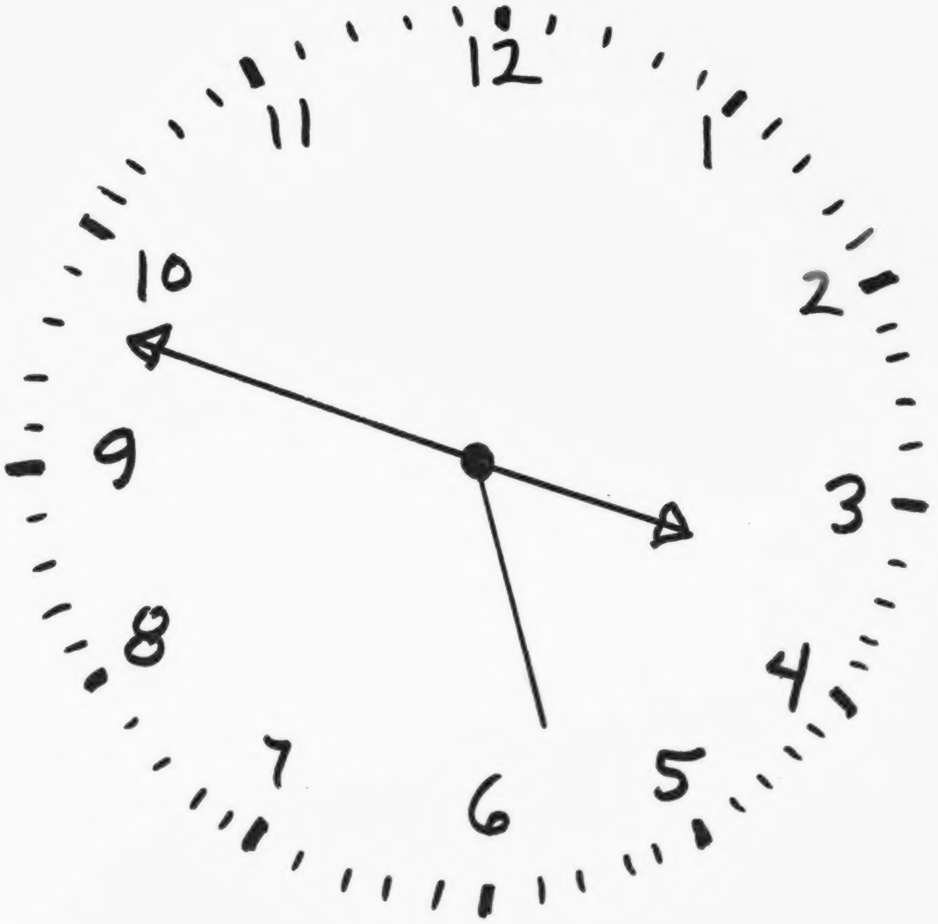
past
present
future
today
tomorrow
month
week
year
time
last
next

seasons
spring
summer
autumn
fall
winter
birthday
calendar
yesterday
hot
cold

1. There are twelve____________in a year.
2. The winter months are ______________, ______________, ______________.
3. The calendar tells the _____________, ____________, and the _______.
4. What season do you play in the snow?____________.
5. Your birthday is in the month of _______________.
6. Autumn is the opposite of ______________.
7. The seasons of the year are _________, ___________, _________, __________.
8. Yesterday was ______________________.
9. Today is ________________________.
10. Tomorrow will be _____________________.
11. This month is ____________________.
12. Next month will be _________________.

We Measure Time

We measure time by hours, minutes, and seconds.
We use watches and clocks to measure time.



Which part of the clock measures the seconds?
Which part of the clock measures the minutes?
Which hand of the clock shows the hour?
Which hand of the clock shows the minutes?

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 8			
1. To be able to correctly place the hour hand in position on a model clock given any hour.	1. Review the new concepts of time learned the previous day. 2. Make clocks using paper plates and hands of oaktag. 3. The teacher sets the hands on the large cardboard clock for the class to read. The children set their own clocks to match.	Paper plates and hands drawn on oaktag Scissors Brads Large cardboard clock	What Time Is It? Is it time to go to school? No, it is time to go to the pool. May I go down to the next block? If you can tell time by a clock.
2. To be able to approximate the correct position of the minute hand given various times by the teacher.	4. The teacher calls on each child, allows him to name an hour, set his clock as the example for the class. Then the teacher randomly names hours and each child sets his clock appropriately. The teacher should correct mistakes at this time.	Chart paper Magic marker 9" x 12" ruled newsprint Pencils Duplicated worksheets	
3. To be able to read and verbalize the correct time given various positions on a demonstration clock.	5. Write experience chart. Read aloud Seatwork: Children copy the chart for their notebooks. Read aloud The Table of Time worksheet. Fill in the blanks individually. Do duplicated number sequency individually.		

The Table of Time

60 seconds (sec.) = 1 minute (min.)
60 minutes (min.) = 1 hour (hr.)
24 hours (hr.) = 1 day (da.)
7 days (da.) = 1 week (wk.)
30 days (da.) = 1 month (mo.)
12 months (mo.) = 1 year (yr.)
day, month, year = date

Complete each sentenc

Today is ________ da te is ________ ____ ____.
Today is in the f the month.
The name ____________________.
This is onth of the year.
My birthc ________ ______ ______.
There are ______ days, _____ weeks, _____ months until my birthdate. (Use a calendar to find the answer.)
There are ____ days in a school week.
The school year ends in the month of ________.
There are ______ days in a school year.

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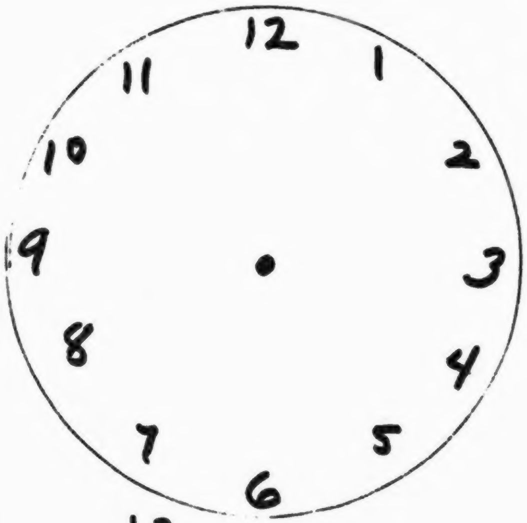
Write the days of the week.

__________ __________ __________ __________
__________ __________ __________

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 9			
1. To demonstrate an understanding of the relation of sleeping time to health by verbalizing the number of sleeping hours needed to operate healthily and efficiently and to indicate the results of insufficient sleep.	1. Show film Sleep for Health. It presents the importance of regular sleeping habits. Shows the child how a regular bedtime allows for sufficient sleep; and how lack of sleep causes irritability and interferes with fun.	Film: Sleep for Health U-3174, University of Iowa Audiovisual Center. Small paper plate Hands drawn on oaktag	Reasons for Sleep We need eight hours of sleep each night. Ten hours is best. Sleep helps us
2. To be able to write a paragraph describing how our lives are regulated by time	2. Discuss the title on the bulletin board "There is a Time for Everything". Discuss what time we get up, eat breakfast, come to school, go out to play, go to lunch, go home, eat supper, watch TV, and go to bed. Assign students to look through magazines and cut pictures to illustrate the different times. Make clocks the same as yesterday. Thumbtack clocks and pictures on bulletin board.	Brads Old magazines Bulletin board Thumbtacks Scissors Chart paper Magic markers	grow work harder feel better have more fun.
3. To understand that there are times which are appropriate for one activity and not for another by matching various activities with logical and proper times.	3. Write experience chart and read aloud. Pass out duplicated poems which teacher reads and children discuss. Seatwork: Complete worksheet. Write a paragraph describing ways in which time regulates our lives.	9" x 12" ruled newsprint Pencils Duplicated worksheets	

Name ____________________

Make it say:


12
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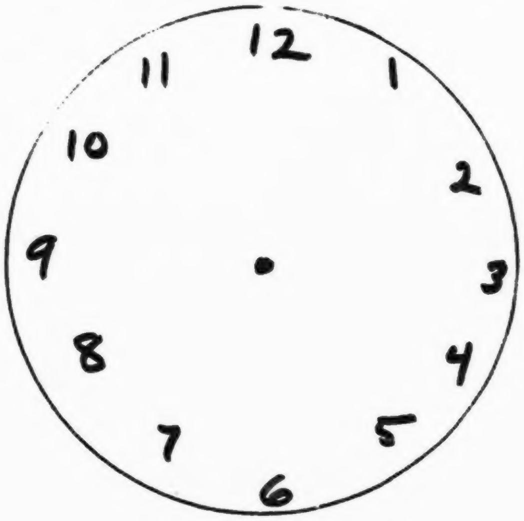
12 o'clock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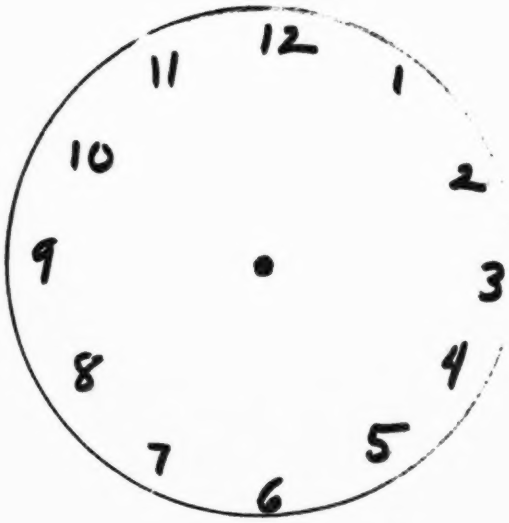
3 o'clock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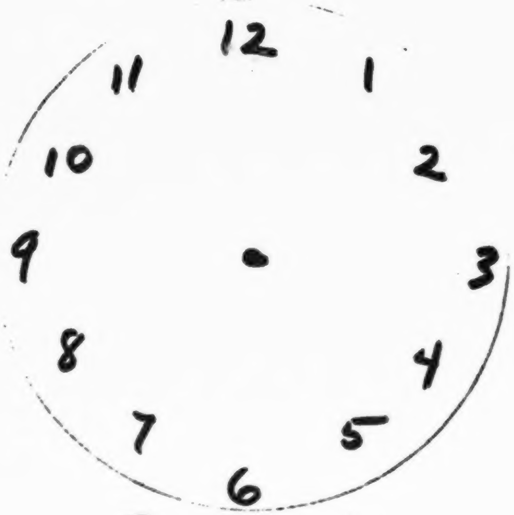
7 o'clock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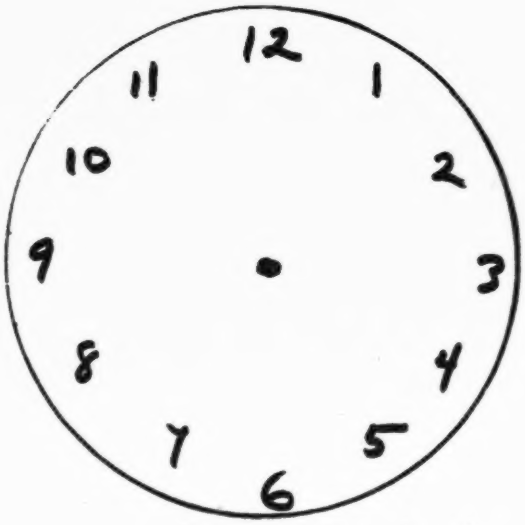
9 o'clock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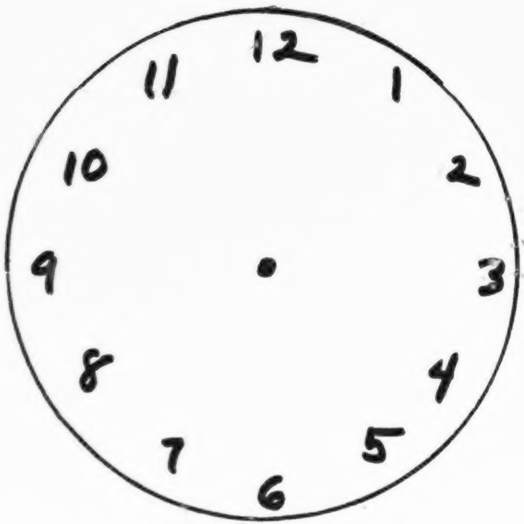
11 o'clock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10
11

5 o'clock

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 10 1. To be able to indicate the starting times, quitting times and total working hours of various grocery workers.	1. Discuss the fact that we are going to a grocery store (Eagles, Giant, A & P) etc. to: (a) See a time clock (b) Find out who uses it and why (c) Find out how long men work each day.	Grocery store Store manager Time clock Time cards Duplicated worksheets Pencils Chart paper Magic marker 9" x 12" ruled newsprint	Our Trip to Eagles We went to Eagles Store and saw a time clock. The manager, Mr. Smith, showed us how to "punch" in and out. You are paid by the hour.
2. To be able to (a) recognize a time clock in a grocery store. (b) verbalize how a worker uses a time clock (c) Read the time card and indicate the time on the clock.	2. Walk or ride to the grocery store. Have the manager demonstrate how the time clock works. The children are given a card to experiment with. The manager answers their questions and explains terminology such as "punch in and out" and "breaks," such as a lunch break. 3. Return to school. Discuss and evaluate the trip and how to use and read a time card. 4. Write an experience chart. Read it aloud. Read The Time Clock aloud. Do worksheets. Vocabulary: time clock, break, punch in, punch out		

The Time Clock

When you work you use a time clock. You are paid by the hour. The time clock tells how long you work each day.

1. How many hours does Mr. Smith work from 8 o'clock a.m. to 12 o'clock noon?
   Make clock #1 say 8:00 a.m.
   Make clock #2 say 12:00 noon

2. Mr. Smith "punches" out at 12 o'clock noon and "punches" in at 1 o'clock in the afternoon. How much time does he have for lunch?
   Make clock #3 say 12:00 noon
   Make clock #4 say 1:00 p.m.

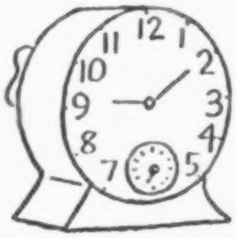
3. Mr. Smith works from 1 o'clock to 5 o'clock in the afternoon. How many hours did he work?
   Make clock #5 say 1:00 p.m.
   Make clock #6 say 5:00 p.m.

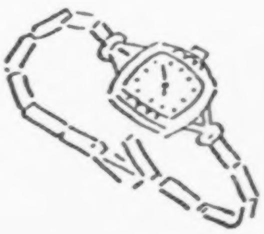
INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 11			
1. To be able to name time telling devices taught in previous lessons. 2. To be able to read and set and use an alarm clock: (a) set the clock (b) set the alarm (c) wind the alarm 3. Keep time with a metronome set to music by tapping foot at appropriate times.	1. Review previous lessons by referring to the variety of pictures of time-telling devices. Handle and examine an alarm clock, woman's wrist watch, mantle clock, metronome, and sandglass. 2. Demonstrate the setting and winding of an alarm clock. Pass the clock from student to student and have them set the clock and the alarm to different times. Talk about different reasons for setting a clock: (a) get to school or work on time (b) time a pie or cake (c) time a short nap. Emphasize the importance of being on time. Read the duplicated sheet, "The Alarm Clock" together. Read the written problems aloud as a group. 3. Review the "Cuck-Coo Clock" song. Set the metronome at different speeds to illustrate the time in music. 4. Write experience chart. Read aloud.	*Wonderful Time.* McGinley, Phyllis. New York: J. B. Lippincott, 1965. All clocks, watches and metronome mentioned. Actual alarm clock Song "The Cuck-Coo Clock" Chart paper Magic markers Duplicated worksheets Pencils	*Being on Time* Being on time is important because we don't want to: Miss a bus. Miss school. Not get paid as much. Make people angry with us. An alarm clock helps us: Save time. Measure time. Wake on time.

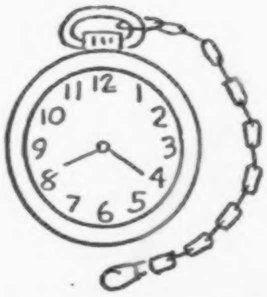
INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
Lesson 11 (Cont.)	Seatwork: Fill in the blanks on the Review. Vocabulary: alarm clock, set, wind.		
LESSON 12			
1. To be able to tell time in half-hour intervals.	1. Cover half of your paper play clocks with construction paper. Count how many minutes are in half of it.	Paper plate clocks Construction paper	The Half-Hour The clock is divided in two parts.
2. To construct a schedule and keep a log of daily and weekly activities.	2. Divide the face of the real alarm clock by setting the little hand at six and the big hand at twelve. Count how many minutes in each half.	Real alarm clock Duplicated worksheets Pencils	There are thirty minutes in each half hour.
	3. Explain that as the minute hand moves past the hour, the hour hand also moves slowly toward the next hour. When the minute hand is at 6 on the clock, it indicates that the hour hand is half way between the last hour and the next hour. We call this position half past the hour. Have the children set their paper clocks at various positions at half past certain hours and read the results.	Chart paper Magic marker 9" x 12" ruled newsprint	There are two half hours in one hour.
	4. Discuss the duplicated paper My Week. Fill out Sunday and Monday as a class. Ask the children to keep this in their		

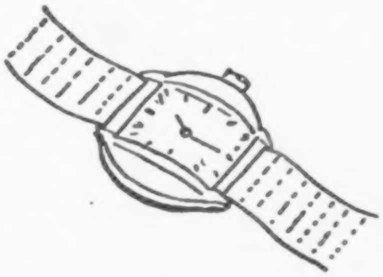
Treat Me Gently

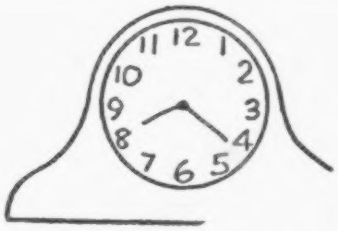
Below each picture write its name.
On line two tell when or where each is used.

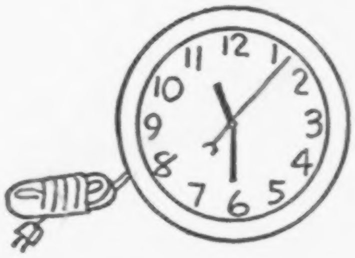












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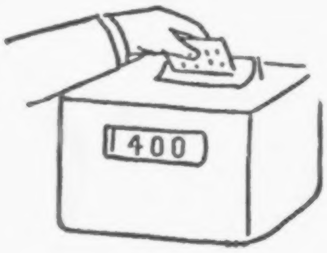
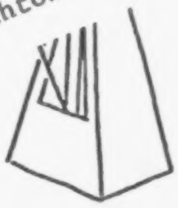
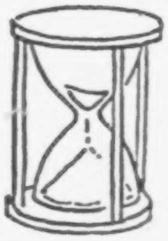




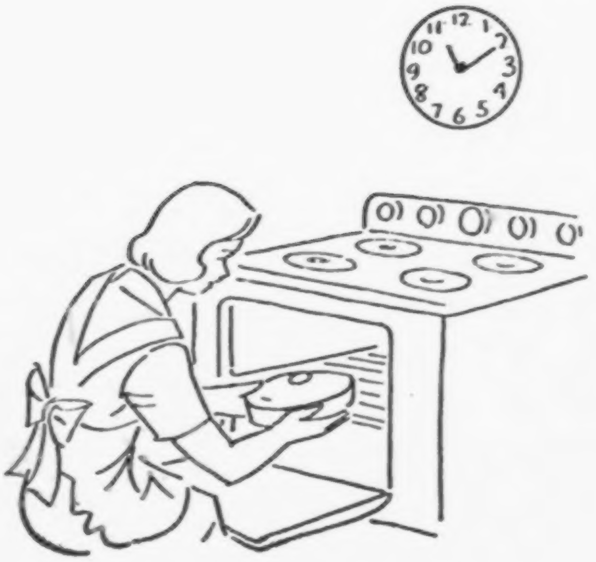


Things to remember when using a time-telling instrument:
1.______________________ 2.______________
______________ 3.______________________

It is ______ o'clock by the classroom clock.

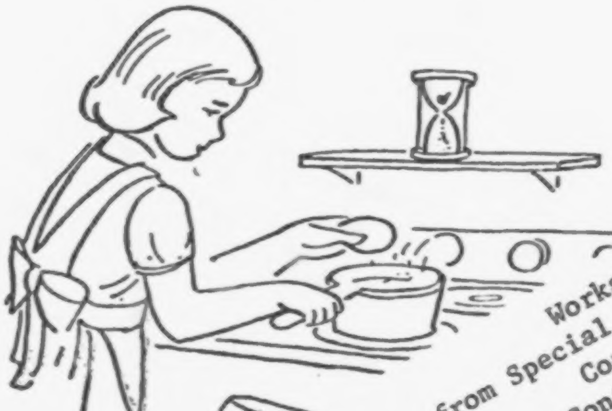
Today is____________, ____________ ____, 19____.

Using Time



Mother wants to have lunch ready at 12:15 P.M. The food in the casserole needs 60 minutes baking time. Will the food be baked in time for lunch at 12:15 P.M.?

Yes ___ No ___



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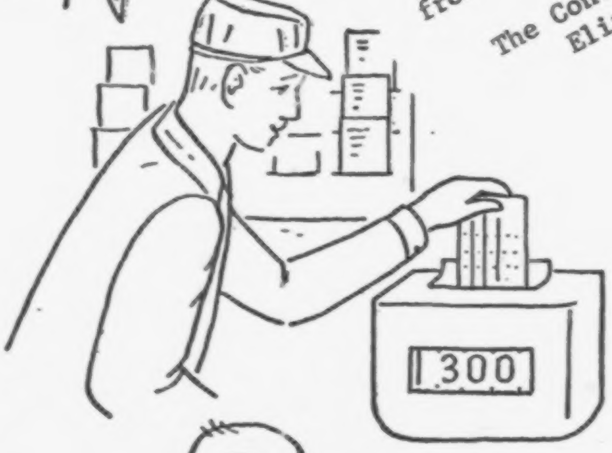
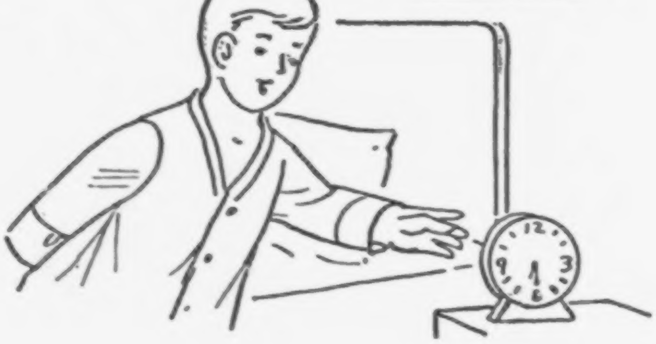
Jane wants to cook a three minute [illegible]. She uses the hour gl [illegible] the time. How [illegible] when the egg [illegible]: ______________

____



Mr. Jones reports for work at 3:00 P.M. He works eight hours. What time will the clock say when Mr. Jones punches time out?

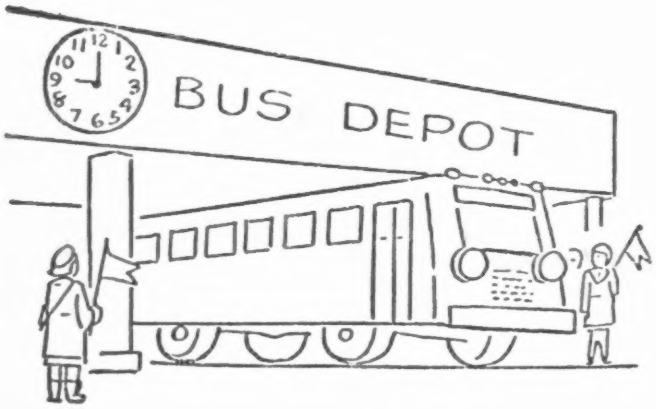
______ o'clock ___M.



Tom delivers papers before school time. At what time does Tom arise?

______ o'clock ___M.

Being on Time



Mary is going to a football game. The bus leaves at 9:05 A.M. Mary checks the time and finds she has ____ minutes before the bus leaves.

Church begins at 11:00 A.M. Father looks at his watch. It [illegible] 50 A.M. Will the family [illegible] time for the church Yes _____ No _____

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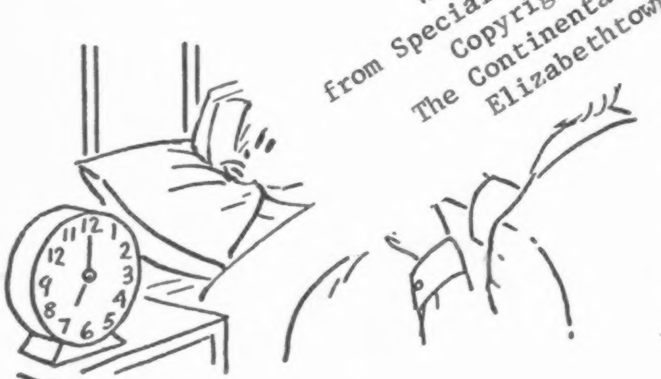
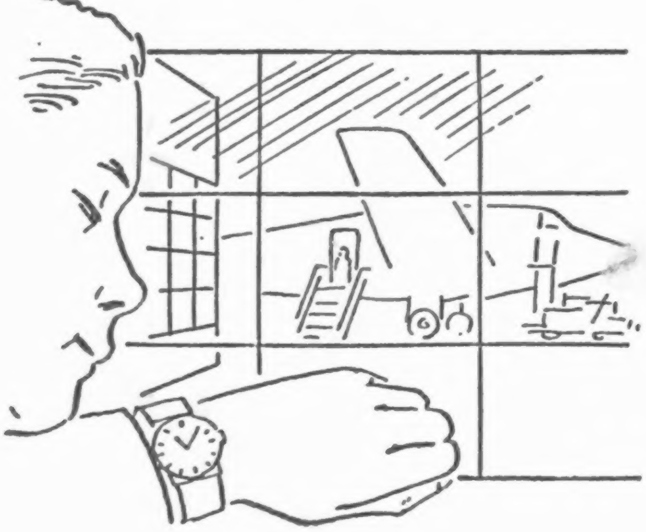


Dr. Smith wants Mrs. Brown to get her medicine at 7:00 o'clock, 9:00 o'clock, 11:00 o'clock. Is Nurse Jones obeying orders? Yes____ No____ How can you tell?__________

____

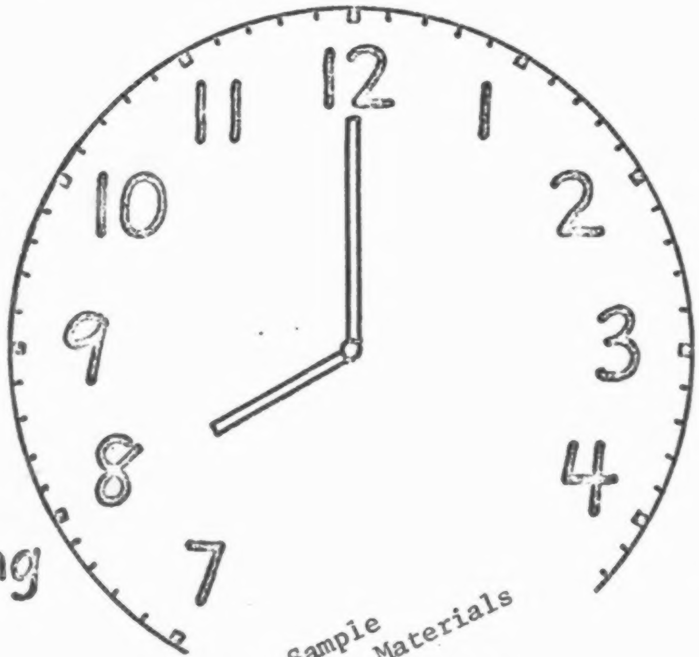


Air flight 426 leaves at 11:55 A.M. Pete has a reservation for flight 426. He looks at his watch. It is 11:05 A.M. How long must Pete wait until the plane leaves? _____ minutes.

Review

Draw a line from the time-telling word to the picture of the word.

little hand
face of clock
large hand
small hand
big hand
minute marking



pointers
hour hand
minute hand
hour marking
number
short hand

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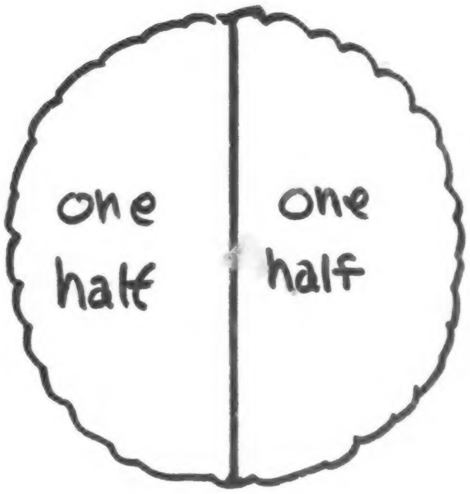
Complet

1. c__oc
2. han___s
3. cloc___face
4. h___ ___ ___ hand
5. num___ ___ ___
6. m___ ___ute
7. h___ ___r
8. b___ ___
9. l___tt___e
10. l___r___e
11. ___mall
12. l___ ___g hand

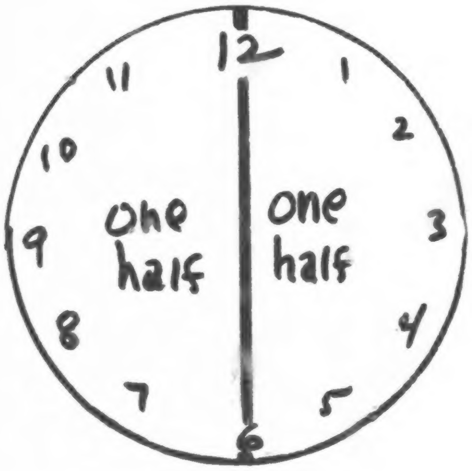
There are _____ minutes in one _____.

INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 12 (Cont.)	notebooks and work on it daily. 5. Write an experience chart and read it. Seatwork: Copy the experience chart for the notebook. Do the two duplicated worksheets after explanation. Vocabulary: half past, thirty		
LESSON 13 . To be able to use the TV guide in Sunday's newspaper to locate times of various programs.	1. Discuss the weekly TV guide from the newspaper. Go through and find how it is divided into days. Take one day and read the time to discover how often programs are scheduled. Find the earliest program. Find the latest program. 2. List on the blackboard the days of the childrens' favorite programs. Have them set the time on their paper clocks. 3. Write experience chart. Read aloud. Seatwork: Complete two duplicated worksheets according to directions given by teacher. Vocabulary: TV Time Table, early, late	Weekly TV Time Table from Sunday Cedar Rapids Gazette Paper plate clocks Chart paper Magic markers Duplicated worksheets Pencils	TV Programs "Milton the Minus" is on at 8:30 A.M. "Discovery" is on at 9:00 A.M. "Marshall Dillon" is on at 5:30 P.M. "Gentle Ben" is last at 6:30 P.M. Which do you like best?

HALF HOURS

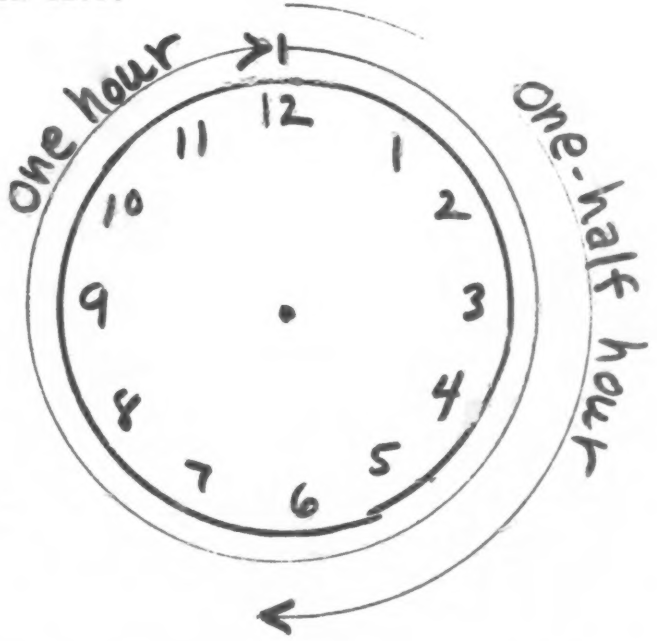

one half
one half

Two halves of anything are equal to a whole. If you take a pie and cut it down the middle, you get two pieces that are the same size. Each piece is one half of the whole pie.

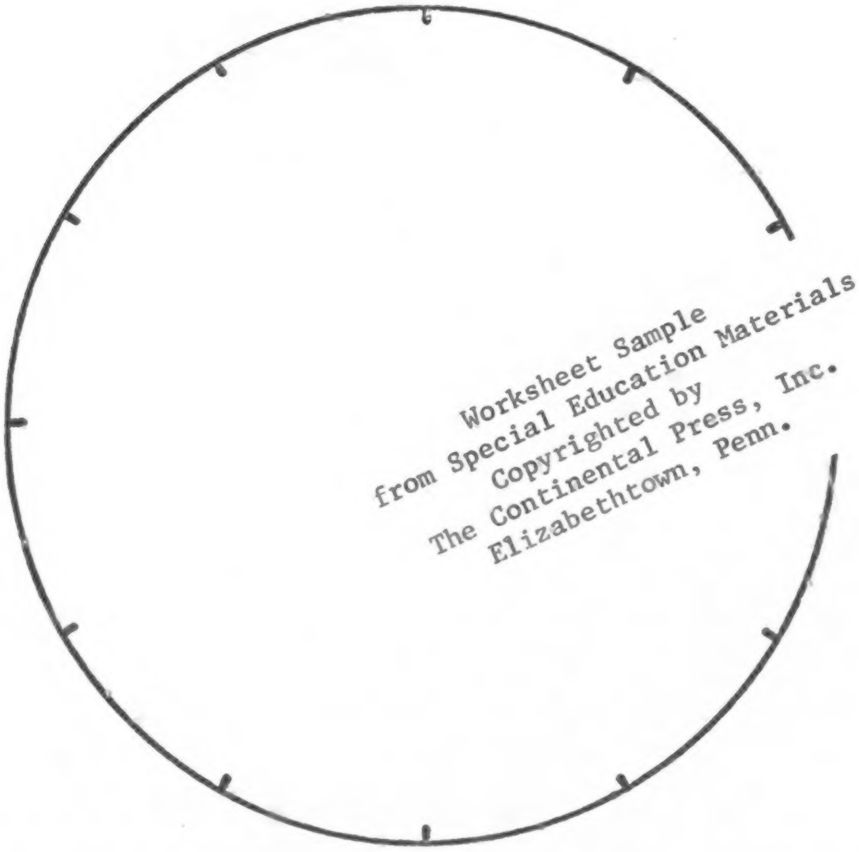

12
1
2
3
4
5
6
7
8
9
10
11
one half
one half

If you draw a line down the middle of a clock face, you divide it into two parts that are the same size. Each part is one half of the whole clock face.

Since it takes the minute hand one hour to go around the whole clock face, it takes half of an hour to go around half of the clock face. There are 60 minutes in an hour. On half of a clock face there are 30 minutes. So, every 30 minutes is a half hour.


one hour
one-half hour
12
1
2
3
4
5
6
7
8
9
10
11

The Half-Hour



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Write numbers on the clockface.
Show half past three o'clock.

Complete each sentence:

When the big hand is at 12 and the little hand is at 6, it is _____ o'clock.

When the big hand is at 6 and the little hand is between 1 and 2, it is _____ o'clock.

1 hour = _____ minutes
1 half-hour = _____ minutes

My Week

Complete the chart. Tell what you do each day at the time shown on the time line.

Write dates of this schedule:

__________ ____ to __________ ____ 19____.

Date	Days of the week	Time				
		A.M. A.M. 7:00-9:00	A.M. P.M. 9:00-3:30	P.M. P.M. 3:30-6:00	P.M. P.M. 6:00-9:00	P.M. A.M. 9:00-7:00
	Sunday					
	Monday					
	Tuesday					
	Wednesday					
	Thursday					
	Friday					
	Saturday					

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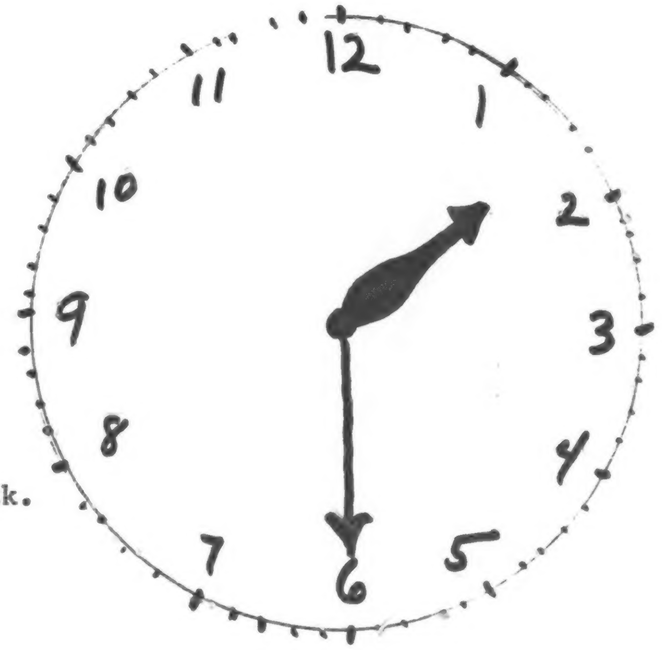
It is ______ M. o'clock by the classroom clock.

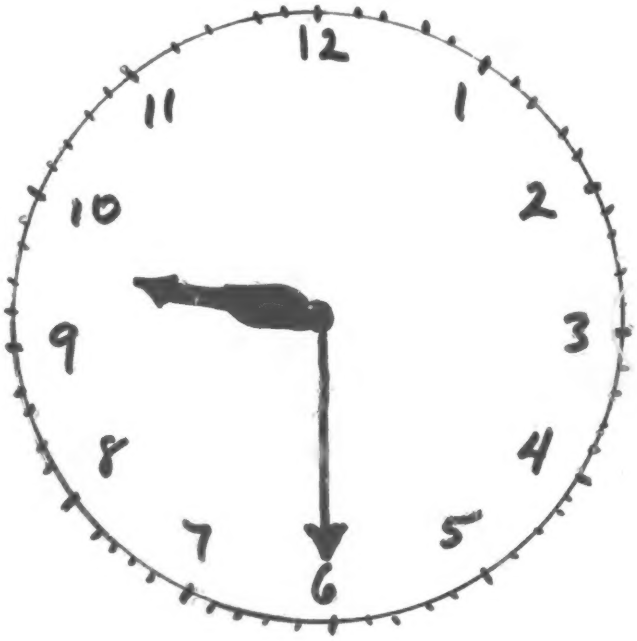
There are ____ hours and ____ minutes until dismissal time.

Today is______________, ____________ ____, 19____.

In one hour, the minute hand of a clock goes all the way around the clock. It goes from number 12 all the way around to number 12 again. When the minute hand points to 6, we say that it is "half past" the hour--it has gone halfway around the clock.

This clock says half past one. The hour hand is halfway between 1 and 2. The minute hand points to 6. We can also say that the clock says "one thirty," because it is thirty minutes past one o'clock.



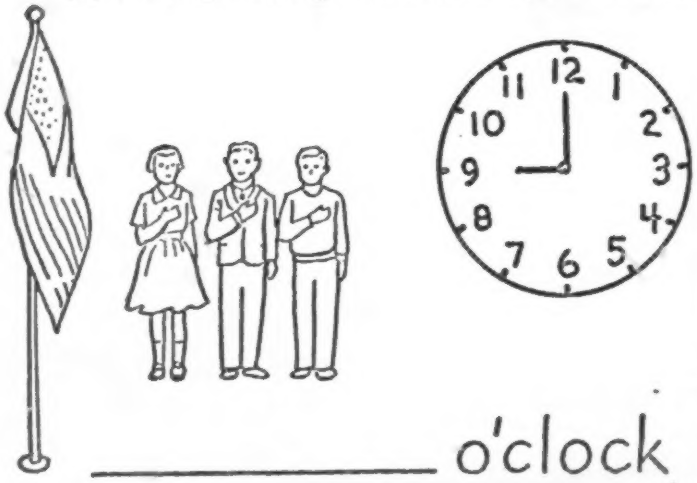


This clock says half past nine, or nine thirty. The hour hand is half the way between 9 and 10. The minute hand is at 6. Whenever the minute hand is at 6, the clock says "half past."

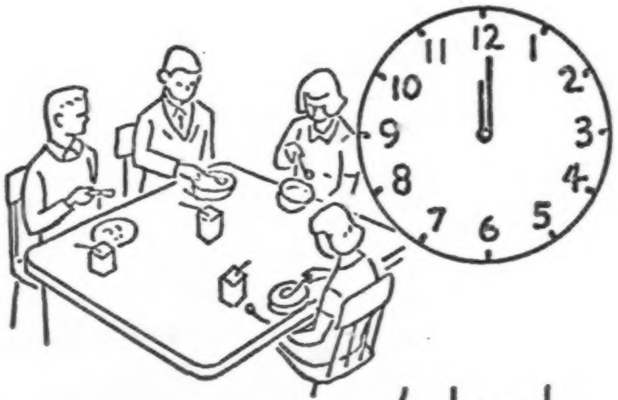
INSTRUCTIONAL OBJECTIVES	ACTIVITIES	RESOURCE MATERIALS	EXPERIENCE CHART
LESSON 14			
1. To be able to demonstrate the ability to use time concepts in a practical situation by finding the day and time of favorite TV programs in the TV Guide. 2. To verbalize the need to limit TV time so that school work may be done and so that one gets enough sleep. 3. To verbalize the need to share TV time with other members of the family and to indicate those hours which are best for children (5:00 P.M. - 8:00 P.M.) and best for parents (later at night).	1. Review yesterday's lesson on the TV Guide. Have the children find their favorite programs for tonight Set their paper plate clocks. Discussion by the children of good and bad points of programs. Discuss the necessity of watching only a short time on school nights. Recall the reasons for enough rest. Discuss family responsibility of TV watching which includes sharing time with other children, watching good programs and watching during the hours that are best for proper programs. Late hour programs are more suited to adults. 2. Talk about "My Week", bringing it up to date. 3. Write experience chart. Read aloud. Seatwork: Copy experience chart for notebook. Complete both worksheets and put in notebook. Vocabulary: channel, program	TV Guide Paper plate clocks "My Week" duplicated sheets Worksheet Pencil Chart paper Magic marker Duplicated worksheets Old magazines Scissors Paste	TV Guides TV Guides tell: the day, the time, the name of the program the number of the channel. Keep it to use each week.

Hours and Half-Hours

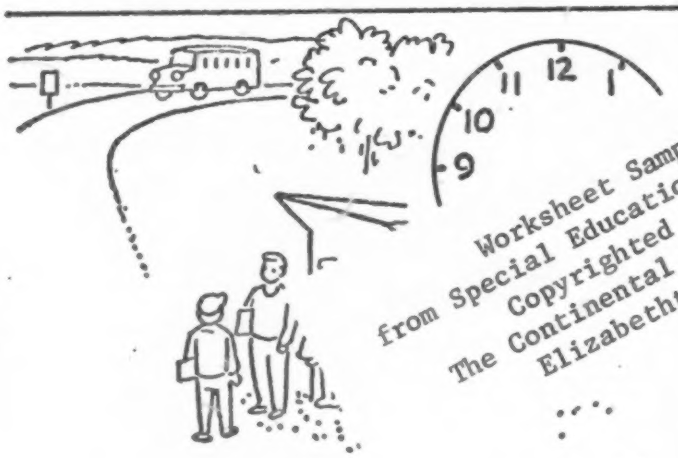
Write the time on the line below each picture.



__________ o'clock



__________ o'clock



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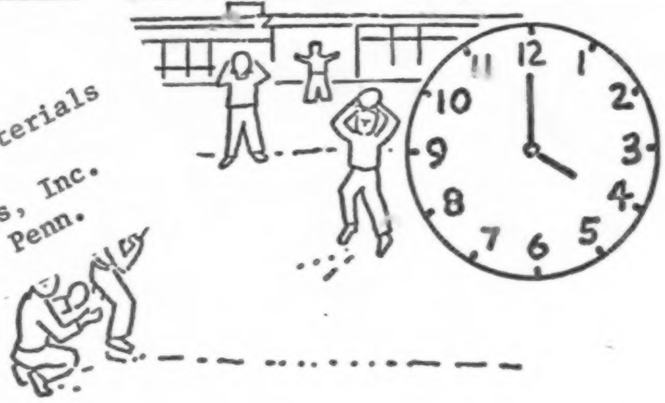
__________ o'clock



__________ o'clock

Complete each time word.

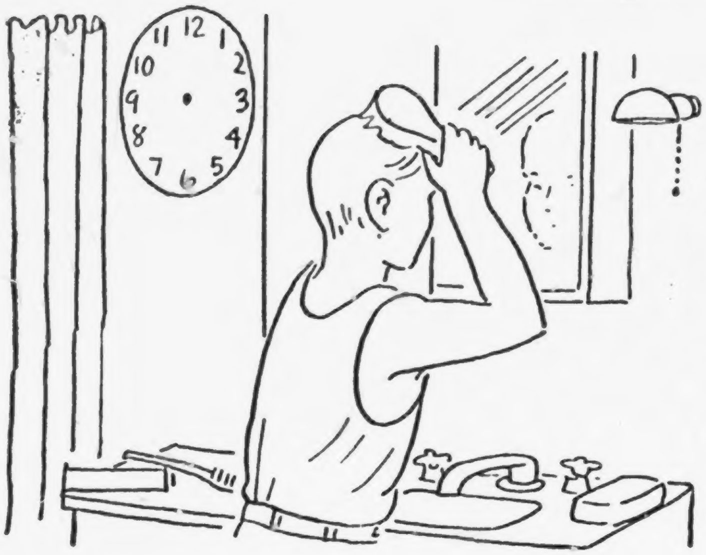
1. __our
2. __'clock
3. f__ce
4. han__s
5. __ig pointer
6. l__rge hand

Find three pictures showing time and paste them on the back of this page.

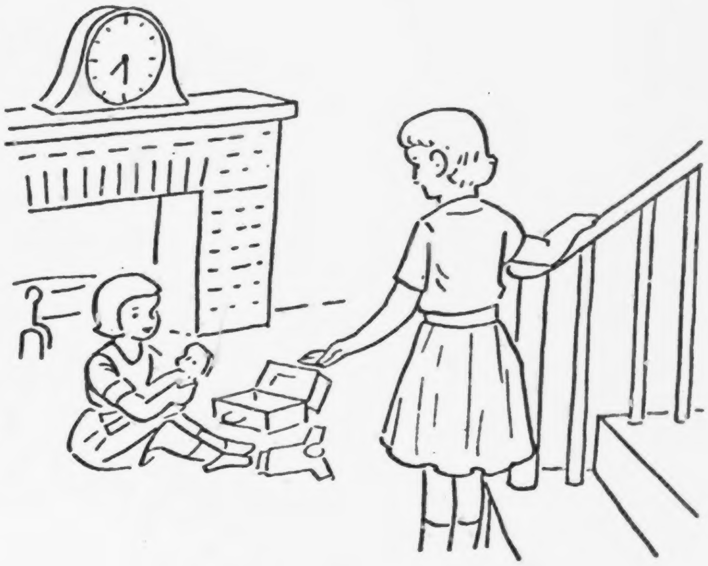
One hour = ____ minutes

A half-hour = ____ minutes

Daily Activities



John leaves for school at 8:30 A.M. Show, on the clock, the time John leav for school.



ıe, Sally, it is time for lly goes to bed at . ____M.

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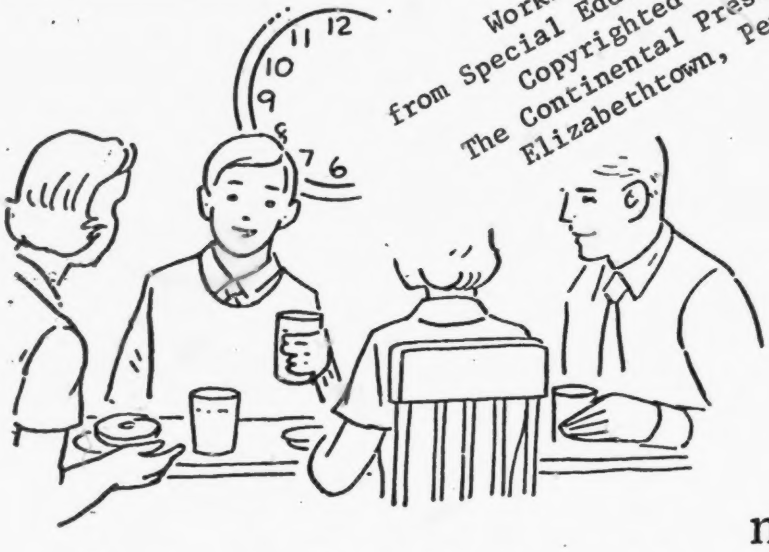
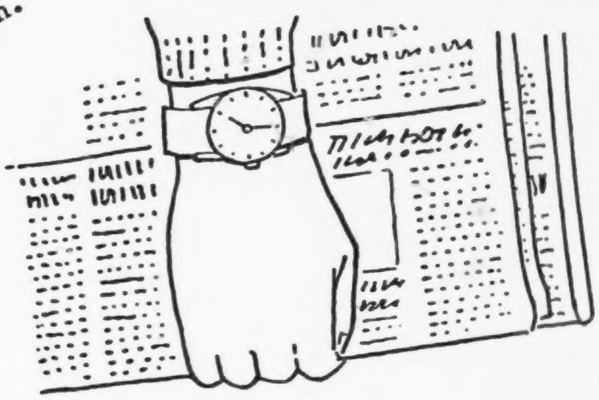


"It is 7:30 A.M.", said Mother, "time to leave for school." Show, on the clock, the time the children leave for school.



Peter delivers morning newspapers. He looks at his watch. The little hand is at 7 and the big hand is at 12. What time does Peter's watch say? It says, ____ ____M.

Today is ________day, ________ ___, 19___.

CHECKING ACCOUNTS

STARTER UNIT TOPIC

FOR

ADVANCED LEVEL

EDUCABLE MENTALLY RETARDED

UNIT TOPIC--CHECKING ACCOUNTS

I. RATIONALE

The skills required in using checks for family business are seldom taught in school programs. That these skills are useful needs little testimony when we look at the vast numbers of families who conduct their business via checking accounts. Fortunately, normal young people quickly learn the necessary skills when they begin housekeeping, but the retarded young person has limited ability to pick up these skills spontaneously and quickly. When he tries, he is often faced with failure along with possible legal repercussions. The business world often has little patience for helping the unfortunate when its money is at stake. It behooves us, as educators, to make absolutely sure that these young people are able to handle checking procedures competently. Therefore, a systematic unit on checking accounts qualifies as an important curricular step to aid the economic adjustment of the retarded young adult.

II. SUB-UNITS

A. Shopping and buying
B. Budgeting
C. Credit and Installment buying
D. Banking services
E. Insurance
F. Home maintenance
G. Occupations
H. Wages and taxes
I. Application forms
J. Writing business letters
K. Home repair

III. GENERAL OBJECTIVES

A. To learn to accurately subtract and add monetary figures.

B. To learn what information is needed for filling out checks and stubs.

C. To learn the social skills necessary for inquiring and opening a checking account with the bank.

D. To understand the relationship between checks and money.

E. To learn to spell numbers one through one hundred.

F. To understand the legal requirements and penalties related to check writing.

G. To develop a sense of responsibility related to having and using a checking account.

H. To understand the process involved in writing checks from the time it is written until it is processed by the bank.

IV. CORE AREA ACTIVITIES

A. Arithmetic Activities

1. Write dates on checks and stubs.
2. Compute the amounts of withdrawals, deposits and balances in a checking account.
3. Write in numerals and in words monetary amounts on sample checks.
4. Compute the balance in the account after a deposit - withdrawal.
5. Convert a check amount into cash, i.e., $25.50 is equal to two tens, one five and one fifty cent piece, etc.
6. Complete various worksheets dealing with basic arithmetic processes.
7. Have students shop for groceries from a newspaper advertisement--itemize the list--compute the amount and write a check covering the purchase.

B. Social Competency Activities

1. Construct a bulletin board outlining the steps required in opening a checking account.
2. Follow a list of student made rules for field trips.
3. Conduct mock interviews related to opening a checking account with other teachers acting as the bank manager.
4. Role play various check writing situations--grocery buying, cashing a check at the bank, etc.
5. Discuss the consequences of writing checks on insufficient funds--list possible penalties associated with this practice.
6. Have the class plan and participate in a class supply store, giving opportunities to practice check writing in buying.

C. Communicative Skills Activities

1. Develop and read daily experience charts.
2. Use telephone to arrange for a resource speaker from local bank.
3. Formulate questions to ask of the resource persons invited to the class.
4. Read the city map and locate the banks.
5. Write thank you letters to the speakers.
6. Demonstrate blanket and restricted endorsements of checks.
7. Listen to resource speakers from the bank.
8. Read local newspapers to find information dealing with check forgers and legal transgressions.

D. Safety Activities
(Not applicable to the unit)

E. Health Activities

(Not applicable to the unit)

F. Vocational Competency Activities

1. Keep accurate and up-to-date records of the checking account. Tie in with tax and wage records.
2. Have a resource speaker from the bank explain the differences between payroll checks and personal checks.
3. Assign pupils to work in the school supply store to provide experience with checks, buying, and money manipulation.

V. RESOURCE MATERIALS

films and projectors
film strips
bulletin board materials
field trips
pamphlets from bank
sample blank checks

pass books
telephone and directory
worksheets
resource speakers and interviewers
city map

bus routes and schedules
provisions for class bank
account application forms
sample cancelled checks
sample bank statement

Resource Books: Lawson, Gary D. EVERYDAY BUSINESS. Cal-Central Press: Sacramento, 1964.

Mooney, Thomas J. ARITHMETIC THAT WE NEED. Frank E. Richards: Phoenix, N. Y., 1966

Parsky, Larry M. MATHEMATICS FOR CITIZENSHIP. Maxfex Associates, Inc.: Johnstown, Penn., 1967.

VI. VOCABULARY

payee
drawer
Pay to the order of
account
check
amount
cash
cashing
signature
fraction
stub
balance
balance brought forward
deposit
total
balance carried forward
numbers one through one hundred
names of months

proof
endorse
record
check blanks
receipt
address
signature card
pass book
deposit slip
money
decimal
subtract
add
bank teller
cashier
currency
coin
stop payment

joint checking account
cancelled check
payment
legal
account number
employment
I. D.
number
date
bank manager
bank
restrictive endorsement
full endorsement
blank endorsement
checking account
individual checking account
business

LESSON #1

SCOPE OF THE LESSON:
1. Introduce the unit on check writing.
2. Demonstrate the advantages of doing business by check.
3. Encourage interest by presenting a role playing situation, dramatizing the hazards of doing business by cash.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To demonstrate an interest in a unit on check writing by offering at least one verbal contribution to class discussion following a role playing situation.	1. Introduce and motivate the lesson by having a group of students or teachers role play a situation involving a transaction using money (cash). In the process, a good deal of money is lost (falls out of pocket). The basic situation may be further dramatized depending on the creativity of the actors and teacher. (Janitor may sweep up money and place in trash, etc.)	Role playing characters Overhead projector Check blanks Play props; money, broom, costume clothing, etc.	If one carries too much money in cash it may be easily lost as we saw in the play. A better and safe way to carry out business is to write checks for the correct amount. Today we learned the parts of a check.
2. To follow a teacher demonstration of the check and parts by marking various parts as they are explained.	2. Stimulate discussion of the situation by asking questions such as: (a) What happened in the play? (b) Who lost the money? (c) How could the loss be prevented? (d) What is a check? (If this is mentioned). (e) How could writing a check prevent the loss? (f) How do you write a check? (g) Can anyone write a check? Why or why not?		
	3. Introduce a check by passing out check blanks to each student. Use overhead projector to demonstrate the various		

	parts of a check. Have the students make small marks near each part to indicate that they are following the demonstration. List the major parts of the check on the blackboard: (a) Check number (b) Date (c) Payee (d) Amount (Numerals) (e) Amount (written out) (f) Drawer (g) Address of drawer (h) Account number (i) Bank number		

LESSON #2

SCOPE OF THE LESSON:
1. Introduce the function of a checking account.
2. Present the financial, social, and legal responsibilities which accompany a checking account.

Instructional Objectives	Activities	Resource Material	Experience Chart
1. To exhibit attentiveness to the guest speaker by participating in an open discussion to the extent of at least one verbal contribution in the form of a	1. Introduce a guest speaker from a local bank who will explain the functions of a checking account in a simplified manner. His presentation should also include the legal, social, and financial responsibilities of the bank, the drawer, and the payee. 2. Instigate a discussion of the functions of a checking account by asking both the speaker and students questions. Examples might be:	Local bank representative Opaque projector Blank checks	A checking account is a good way to manage our money because: 1. Cancelled checks are proof of payment. 2. Checks are safer than cash. 3. A check can be

question or a comment. 2. To demonstrate an understanding of the responsibilities inherent in maintaining a checking account by listing at least three basic check writing rules.	(a) What happened to the man who carried cash in yesterday's lesson? (b) Why pay bills by mail with checks? (c) What proof of payment do you have when you pay by check? (d) Who can cash a check? (e) How large a check can you write? (f) Can anyone write a check?		written for any amount you have in your account. 4. Checks can be cashed only by the payee. 5. Cash can be lost or stolen but your checks are only good if you sign them.

LESSON #3

SCOPE OF THE LESSON: Introduce the procedures required to establish a checking account.

Instructional Objectives	Activities	Resource Material	Experience Chart
1. Show attentiveness to a demonstration of the procedure in completing a signature card by marking lightly with pencil the various parts of the card as they are explained.	1. Distribute signature cards. 2. Use an overhead projector to demonstrate the proper method of filling out a signature card. The students should mark each item lightly with pencil as it is explained. 3. Explain the need for a legal signature and why one must be consistent in its use. 4. The students should correctly fill out a signature card. 5. Distribute deposit slips. 6. Use an overhead projector to demonstrate the proper filling out of a deposit slip.	Signature cards Overhead projector Mathematics for Citizenship, Larry M. Parsky. Pages 4-8.	A checking account will be an easy way to keep my money. To get one started I must: 1. Fill out a signature card and remember to always use my legal signature when signing checks. 2. Deposit some money in the bank, using the bank's deposit slips.

2. To demonstrate the ability to instigate the opening of a checking account by properly filling out a signature card and a deposit slip.	7. The students should fill out sample deposit slips using the projected sample as a model. They should use their own names and addresses, the correct date, leave the account number space blank and the sum to be deposited the same as on the projected sample.		
3. To show that the need for a legal signature is realized by consistently using the same signature on practice checks and other school papers.	8. It should be explained that until a deposit has been made, no checks can be written against the account.		

LESSON #4

SCOPE OF THE LESSON: Impress upon the pupils the need for being able to write in numerals and in word form the monetary denominations from one dollar to one thousand dollars.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be able to write monetary amounts between one dollar and one thousand dollars in numerals and word form as evidenced by a testing situation.	1. Write the words for monetary amounts along with their equivalents in Arabic symbols from one to twenty by ones, twenty to one hundred by tens, one hundred to one thousand by hundreds. 2. Write the exercises in Mathematics for Citizenship by Larry M. Parsky on pages 12, 13, and 14.	Mathematics for Citizenship, Larry M. Parsky, pp. 12-14.	Before we can write checks and have a checking account we must be able to write amounts of money in words and numerals.

LESSON #5

SCOPE OF THE LESSON: Demonstrate the procedures of writing checks to individuals or to businesses and involve the students in practice situations

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To show the ability to write a check to an individual or a business by properly completing an exercise in which at least one check is written to a person and one to a store or business.	1. Demonstrate the procedure of writing a check by use of the overhead projector. 2. Involve the class in a discussion of the problems and techniques of check writing, using examples of various checks to stimulate discussion. Indicate that not all checks use the same format but that all require the same basic six items of number, date, payee, amount in figures, amount written out and signature of drawer. 3. The class should do the check writing exercises in Everyday Business by Gary D. Lawson, on pages 3 to 8.	Blank checks Overhead projector Everyday Business, Gary D. Lawson, Pages 3-8.	To write a check it is important to have money in the bank. There are several things we must always put on the checks we write. They are: 1. Check number 2. Date 3. Payee 4. Amount in numerals 5. Amount in words 6. Signature

LESSON #6

SCOPE OF THE LESSON: Emphasize the need for accuracy in all entries and balancing on the check stubs.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To show interest in a discussion about check stubs by making at least one verbal contribution during	1. Introduce check stubs and balancing with a discussion of the basic need for this part of having a checking account, i.e., without accurate balancing and proper entries of deposits one never is sure of how much money there is in the account.	Checks and stubs Overhead projector	In this lesson we learned the important need for keeping "our books straight." Proper balancing of a bank book includes:

the introduction of this subject by the teacher. 2. To exhibit attentiveness to a demonstration of the technique of making entries and balancing check stubs by copying on sample stubs the information shown on the overhead projector.	2. Prepare for balancing check stubs with drill exercises in the addition and subtraction of numbers given as monetary figures. 3. Distribute checks and stubs. 4. With an overhead projector demonstrate the method of balancing check books. This should include writing a check, making a deposit and computing the balance. 5. The costs of a checking account including the regular service charge by month, by check, or by balance as well as special charges such as those for checks drawn for an account with insufficient funds should be discussed. 6. Exercises in checkbook balancing for practice and drill may be given from Everyday Business, Gary Lawson, Pages 9-20. Further exercises for drill or testing are Mathematics for Citizenship, Larry M. Parsky, Pages 37-50.	Mathematics for Citizenship, Larry M. Parsky, pp. 37-50. Everyday Business Gary D. Lawson, pp. 9-20.	1. Recording all deposits and adding them to the balance. 2. Recording all checks written and subtracting them from the balance. 3. Knowing how the bank makes service charges and adjusting the balance for these costs. 4. Bring the balance forward to each check stub as each check is written.

LESSON #7

SCOPE OF THE LESSON: Acquaint the students with the proper procedures for cashing checks.

Instructional Objectives	Activities	Resource Material	Experience Chart
1. To show attentiveness to a demonstration of methods of check endorsements by writing endorsements on the back of sample checks as directed.	1. Introduce the techniques of endorsing checks by the blank endorsement, restrictive endorsement, and full endorsement methods. 2. Encourage a discussion of the three endorsement methods and what the function of each is.	Blank checks Overhead projector Mathematics for Citizenship, Larry M. Parsky, p. 30-31.	There are three different ways to endorse checks, each way is used for a different situation. 1. A blank endorsement is used most of the time. To do this you sign your name on the back and across the left end of the check. Do not endorse the check this way until you are ready to cash it.
2. To show evidence of having practiced endorsement techniques by completing assigned exercises.	3. Each student should practice the endorsement methods on sample checks as they are being demonstrated. 4. As seatwork, utilize exercises in Mathematics for Citizenship by Larry M. Parsky on pages 30 and 31. Further practice could be provided by the teacher by making up problems and providing blank checks.		2. A restrictive endorsement is usually used when you send a check to the bank by mail for deposit.
3. To demonstrate the ability to cash checks by the blank endorsement and restrictive endorsement methods in a testing situation where this performance is required.	5. The instructions on endorsement should include the practice of endorsing a check with the same form and spelling of the name as it is given in the payee's space. If the name is incorrectly spelled or stated the check may be reindorsed with the legal signature.		3. The full endorsement is used when you want a certain person or business to cash a check.

LESSON #8

SCOPE OF THE LESSON: Alert students to the legal complications and penalities that accompany improper check writing practices.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To be able to give at least two reasons for keeping one's check book in balance. 2. To indicate an understanding of the legal implications involved as the result of writing checks on a closed account by verbally stating the penalities. 3. To be capable of verbally stating the legal repercussions of forgery.	1. Have a bank representative give a short talk about the dangers of using unassigned checks, writing checks on closed or non-existent accounts and signing another person's name to a check. 2. Conduct a discussion on the ethics of money management as it relates to check writing, honesty, forgery, stealing, etc.	Local bank official	There are some rules and precautions we must be aware of when we use checks. These are: 1. Never use a check except those given to you by your bank. 2. Always sign checks with your legal signature. 3. Never sign any other person's name. 4. Never accept a check unless we are certain of the identity and honesty of the person giving it.

LESSON #9

SCOPE OF THE LESSON: Focus attention on a review and appraisal of competency in check writing and stub balancing.

Instructional Objectives	Activities	Resource Material	Experience Chart
1. To contribute to a discussion relative to check writing and checkbook balancing, either by making at least one verbal response, or by assisting a fellow student who is unsure in any of the steps of check writing or balancing. 2. To show competence in check writing and bank book balancing by performing the assorted operations satisfactorily in a testing situation.	1. Invite discussion and questions during the review and testing phase of the checking unit. 2. Encourage those students who have achieved a more satisfactory level to assist those classmates who are experiencing difficulty. 3. For a four-week period each pupil should keep a mock checking account. Start the account with an initial deposit of $1,000. Each day during the mathematics lesson have a check written for a legitimate expense and entered and balanced in the stub. At the end of each week there should be a deposit made that would be representative of a weekly pay check. 4. Practice in check writing and balancing procedures can be taken from exercises in Mathematics for Citizenship by Larry M. Parsky, pp. 54-116.	Blank checks and check stubs. Overhead projector Mathematics for Citizenship by Larry M. Parsky, pp. 54-116.	Through review and practice we are now ready to open and maintain our own personal checking account. We know that if we manage a checking account carefully our money will be more safely handled than if we used cash. We also realize that we are individually responsible for properly balancing our checkbook. We must not write checks when the balance is too low to cover the check. We know that writing checks when there is insufficient funds is illegal. There is also a special charge when the balance is too small to cover a check.

LESSON #10

SCOPE OF THE LESSON: Acquaint students with the bank statement and demonstrate its function.

Instructional Objectives	Activities	Resource Materials	Experience Chart
1. To exhibit interest in a discussion of bank statements and our need for them by checking items with a pencil as they are explained.	1. Follow a discussion of the functions of the bank statement by checking off the items on a sample form as a bank representative explains them.	Bank official Bank statement Check stubs coordinated with the statement.	It is nice to learn that each month the bank will send a statement and our cancelled checks for the month. This statement helps us to check on how well we have been balancing our account.
2. To demonstrate an understanding of the function of a bank statement by satisfactorily reconciling a bank statement with the checkbook balance.	2. Use a duplicated bank statement and sample checks and check stubs for an exercise in reconciling an account.	Blank bank statement forms Opaque projector	It also lets us be sure that no checks have been forged in our name and that all deposits have been entered. The statement also shows any changes the bank may have made against the account for service, new checks, or overdrawn accounts.